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AUTHOR	Hartwein, Jon; Dunham, John
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ABSTRACT

This manual can be used independently by students in secondary health occupations programs or by persons receiving on-the-job training in a radiology department. The manual includes an instructor's key that provides answers to the activity sheets and unit evaluations. The manual consists of the following five units: (1) orientation to radiology; (2) darkroom duties; (3) basic patient care; (4) radiographic room responsibilities; and (5) office procedures. Units are further divided into lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets as appropriate for the content. Activity Sheets are designed to assist the learner in mastering the information in each lesson. Each unit has a written evaluation, skill sheets that provide a record of mastery of the steps of procedures for each skill, a unit checklist for keeping track of activity sheets, skill sheets, and written unit evaluations. In addition, the manual contains a bibliography listing 20 references and a glossary of 74 terms. (KC)

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Radiology Aide
Instructor Key
Student Manual

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Radiology Aide

Instructor Key

Instructional Materials Laboratory • University of Missouri-Columbia
Missouri Department of Elementary & Secondary Education

Radiology Aide

Instructor Key

Writers:

Jon Hartwein, BA, R.T.(R.)
St. Louis Community College
St. Louis, MO

and

John Dunham, R.T.(R.)
Arcadia Valley Hospital
Pilot Knob, MO

Technical Editor:

Ronda Wahl, Ph.D., R.T.(R.)
University of Missouri-Columbia
Columbia, MO

Veronica Feilner, Senior Editor and Project Coordinator
Sara Davis, Assistant Editor
Instructional Materials Laboratory
University of Missouri-Columbia

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Available from:
Instructional Materials Laboratory
University of Missouri-Columbia
2316 Industrial Drive
Columbia, MO 65202
800-669-2465 or 573-882-2883

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Instructional Strategies

This *Radiology Aide* Instructor's Key is designed to be used with the *Radiology Aide* Student Manual. It provides answers to the activity sheets and unit evaluations. The revised format and content were developed with input from post-secondary radiology instructors, secondary health occupations education instructors, experts in the field of radiology, and personnel from the Missouri Department of Elementary and Secondary Education and the Instructional Materials Laboratory at the University of Missouri-Columbia.

The self-instructional format provides health occupations education instructors the opportunity to address the needs of students whose health career interests are outside the nursing field. Following completion of the Health Care Assistant Core Competencies, a student interested in pursuing a career in the radiology field can achieve radiology specific competencies through this curriculum. Successful completion prepares the student for an entry-level position as a radiology aide as well as a solid knowledge and skill base to continue education in a radiology career.

The *Radiology Aide* curriculum is primarily designed to be used independently by students who are in secondary health occupations programs or by individuals receiving on-the-job training in a radiology department. Instructors should define parameters for the individualized instruction, oversee the knowledge component of instruction (including the Written Unit Evaluations), and identify a clinical site and a clinical supervisor. The clinical supervisor should be responsible for supervising the student while at the clinical site, providing skill training, and evaluating mastery of skills.

Since mastery of the information and skills will be evaluated using the Written Unit Evaluations (pink) and the Skill Sheets (pink), it is recommended that these pages be removed before the manual is given to the student. These pages are located together at the end of the manual.

A Radiology Aide Competency Record Sheet and a Radiology Aide Certificate of Achievement have also been included at the end of this manual. These could be removed and filed with the evaluation instruments.

The student manual is divided into five units: Orientation to Radiology, Darkroom Duties, Basic Patient Care, Radiographic Room Responsibilities, and Office Procedures. Units are further divided into lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets as appropriate for the content. Activity Sheets are designed to assist the learner in mastering the information in each lesson. The clinical/laboratory activities that are included on the activity sheets should be reviewed or discussed with the instructor or clinical supervisor upon completion. The Activity Sheets may or may not be graded depending on individual student's needs and instructor's preference.

Each unit has a written evaluation, which should be administered after all lessons in the unit are studied. A score of at least 80 percent indicates that the student has satisfactorily completed the unit and may proceed to the next unit. Students should review any lessons or materials that correspond to missed evaluation questions because all information presented is important for success as a radiology aide. Skill Sheets provide a record for mastery of the steps of procedure for each skill. The student should practice the skills outlined in the lessons before requesting evaluation of the skills. When evaluating mastery

of the skills, the clinical supervisor can determine that mastery is obtained when he or she feels confident in the student's ability to perform the skill without direct supervision.

A Unit Checklist, located at the end of each unit, provides a method for keeping track of Activity Sheets, Skill Sheets, and Written Unit Evaluations to be completed in the unit.

In addition to being utilized in the secondary health occupations program to prepare radiology aides, the *Radiology Aide* curriculum could be used in other ways as well:

- Health occupations education instructors may choose some units of instruction as an adjunct to teaching career opportunities in radiology.
- Radiology departments and clinical training sites may use all or part of the curriculum in training students or new staff members

Answers to Activity Sheets and Written Evaluations

Note: Answers are not provided for clinical/laboratory activities. Review or discuss these activities with students.

Unit I: Orientation to Radiology

Lesson 1: Exploring the Field of Radiology - Activity Sheet

1. Radiology uses gamma or x-radiation to diagnose and treat injury or disease.

2. An x-ray is a beam that passes through the body to create the image rather than the picture itself.

3. Answers should include five of the following:

   a. Diagnostic x-ray

   b. Nuclear medicine

   c. Computed tomography (CT) scans

   d. Magnetic resonance imaging (MRI) scans

   e. Ultrasound

   f. Mammography

4. A diagnostic x-ray uses radiation to create a permanent film record of the examination. An ultrasound uses high-frequency sound waves to form its images. The image can be seen on video, or a film can be made for a permanent record. Magnetic resonance imaging uses a very powerful magnet and radio waves to manipulate hydrogen atoms. Computer technology creates the image on a monitor, and a permanent record can be made with a camera connected to the computer.

5. Answers should include four of the following:

   a. Orthopedics department

   b. Pulmonology department

   c. Urology department

   d. Gastroenterology department

   e. Emergency room

6. a. A radiologist is responsible for the smooth operation of the department and the radiology staff. Depending on the size of the department, the radiologist may look at and interpret all the radiographs taken by the staff. He or she usually makes the diagnostic decision and writes the final report on a patient's examination results.

   b. A radiographer takes the radiographs, is responsible for the daily operation of the equipment, and has routine protocols to follow when taking radiographs.

   c. A radiology aide will assist any and all members of the team. The radiology aide's duties include transporting patients, setting up or preparing rooms for exams, developing radiographs, restocking materials, and cleaning and maintaining equipment.

Lesson 2: Legal Aspects and Professional Ethics of Radiology - Activity Sheet

1. Answers should include three of the following:

   a. It enhances self-respect.

   b. It develops personal integrity and integrity in relations.

   c. It builds genuine confidence in oneself and others.

   d. It maintains confidentiality and exhibits respect.

2. Answers should include three of the following:

   a. It brings harm to others.

   b. It causes an illegal action.

   c. It causes people to be exploited or belittled.

   d. It treats people as objects.

3. Answers should include three of the following:

   a. Be professional; patient care is the highest priority.

   b. Do not discriminate; treat all people with all kinds of diseases respectfully.

   c. Strive to advance the profession by respecting people's dignity.

   d. Practice what you have learned; radiation safety and good diagnostic studies are the goals.

   e. Act in the best interest of the patient.

f. Work with the goal of helping physicians to diagnose, but diagnosis is beyond the scope of the radiographer.

g. Use accepted standards of practice; limit radiation exposure to everyone.

h. Act ethically and protect patients' rights.

i. Respect confidences; reveal confidential information only as required by law or for the good of the public.

j. Continue to improve your knowledge and skills through education and training.

4. Answers should include two of the following:

a. It is unethical for a radiographer or radiology aide to interpret radiographs for patients. A radiographer should never perform an exam and then offer a diagnosis to the patient.

b. It is unethical for the radiology aide to discuss a patient's illness with other people who are not involved in the patient's care.

c. It is unethical for the radiology aide to work outside the scope of his or her training and experience.

5. Answers should include three of the following:

a. Performing radiographic examinations without a physician's order.

b. Stealing supplies, e.g., taking a pair of disposable gloves for use at home.

c. Performing an intravenous (IV) contrast exam on a patient without his or her consent.

d. Altering a medical record.

e. Causing injury to a patient through negligence.

6. To the health professionals involved with an individual patient's care

7. During transfer from a wheelchair to an x-ray table, Mrs. Smith turned her right ankle when stepping onto a footstool. Mrs. Smith cried out when her ankle was turned, but a minute later she said there was no pain at all and she was fine. Her ankle appeared slightly swollen. The supervisor was notified. The supervisor informed Mrs. Smith's physician by phone of the incident. The physician stated that no further treatment was required and she would follow up the next day. (Answers may vary somewhat.)

Lesson 3: Communication - Activity Sheet

1. The radiology aide should instruct each patient where he or she is to wait for the examination. In some departments, the radiology aide will also communicate instructions to patients on how to prepare for examinations.

2. Empathy is putting oneself in a patient's place and imagining what he or she must be feeling. Sympathy is feeling sorry for the patient. Empathy is more effective for the radiology aide as sympathy may be counterproductive.

3. Ask a supervisor or a radiographer to speak to the patient.

4. Answers should include three of the following:

   a. Sit next to the child or squat at the child's level.

   b. Make eye contact.

   c. Be honest.

   d. Praise children for their courage.

5. Answers should include three of the following:

   a. Offer assistance only when needed.

   b. Offer encouragement.

   c. Be sure patient wears glasses, if needed.

   d. Be sure patient turns on hearing aid, if needed.

   e. Lower tone of voice when speaking to a patient who is hard of hearing.

6. Answers should include three of the following:

   a. Remain calm and reassure the patient.

   b. Break instructions down into small steps.

   c. Repeat information several times.

   d. Allow patients plenty of time to respond.

Unit I: Orientation to Radiology - Written Unit Evaluation

1. b
2. c
3. b
4. a
5. d
6. b
7. c
8. d
9. a
10. c
11. c
12. a
13. d
14. c
15. d
16. c

Unit II: Darkroom Duties

Lesson 1: Preparing the Darkroom - Activity Sheet

1. a. Entry rollers grab the film and pull it gently into the processor.

   b. Crossover rollers grab the film and guide it from one area of the processor to the next.

   c. Recirculation pumps remove chemicals from the bottoms of the tanks and pump them back into the sides of the tanks under pressure to keep the chemicals well mixed.

2. a. Developer

   b. Fixer

   c. Wash (Water bath)

3. Static electricity discharges may occur as the film passes over the feed tray, resulting in unwanted marks, densities, or blurred areas.

4. Cleanup film is a piece of radiographic film that is run through the processor to pick up any foreign matter or dried chemicals from the rollers.

5. The chemical residue will look like tiny white flakes stuck firmly to the film. If there is chemical residue on the film, run another cleanup film. If there are flakes on the third cleanup film, notify your supervisor. The processor must be cleaned.

6. Answers should include three of the following:

   a. Spaces around the door

   b. Spaces around the processor

   c. Spaces around the safelights

d. Spaces around the passbox

7. A strip of duct tape

8. Every time darkroom integrity is checked, open the film bin and check to be sure it is well stocked with film.

9. Unwanted marks, densities, or blurred areas

Lesson 2: Processing Radiographs - Activity Sheet

1. a. Patient's name

   b. Patient's number

   c. Date of birth or age

   d. Date of exam

   e. Name of hospital or clinic

2. a. Film identification printer

   b. Identification camera

3. The emulsion of the film is very sensitive once it has been exposed. If hands are not clean and dry, oil from the fingertips may leave artifacts on the finished radiograph.

4. Open the cassette as though it were a book. Reach in and grasp a corner of the film with your thumb and forefinger.

5. a. An audible "ding"

   b. Safelight over the feed tray

6. A multiloader

7. There might be two patients with the same piece of information (name, birthdate, etc.).

8. Use only screen-cleaning solution and a lint-free cloth to clean intensifying screens.

9. The outsides of the cassettes may be cleaned with a regular cleaning solution.

Unit II: Darkroom Duties - Written Unit Evaluation

1. c
2. a
3. d
4. b
5. d
6. a
7. c
8. d
9. a
10. c
11. b
12. b
13. c
14. d
15. d
16. a
17. b

Unit III: Basic Patient Care

Lesson 1: Safety - Activity Sheet

1. Answers should include three of the following:
   a. Radiation exposure
   b. Electrical shock
   c. Spills
   d. Chemical exposure
   e. Exposure to infection
2. Answers should include two of the following:
   a. Handwashing
   b. Using Body Substance Precautions
   c. Wearing personal protective equipment
3. Answers should include four of the following:
   a. Before and after contact with a patient
   b. Before and after using the toilet
   c. After assisting a patient with toileting
   d. Before and after eating and smoking
   e. Before donning and after removing gloves

f. Whenever hands are soiled with body substances

4. All patients and all blood and body fluids are included.

5. a. Gloves

   b. Masks

   c. Gowns or aprons

   d. Protective eyewear

6. Answers should include five of the following:

   a. Before lifting a patient, make sure the patient knows he or she is going to be lifted. Describe what is going to happen.

   b. Evaluate the size of the load before lifting. Do not attempt to lift a patient or object by yourself unless you are certain that you can handle it alone. Get a partner if necessary.

   c. Check your footing. Spread your feet shoulder-width apart to give you a wider base of support and better balance.

   d. Get close to the object or patient to be lifted. Do not reach! Move in and hold the patient or object close.

   e. Line your body up straight. Maintain the normal curve of your back and bend at the hip and knees, NOT at the waist.

   f. Straighten your legs to lift. Let the stronger muscles of your legs do the work.

   g. Lift the object or patient smoothly, avoiding jerky movements. While lifting with a partner, count to three, lifting together on the count of three.

   h. If you need to turn while holding the object or patient, do so by turning your feet. Never twist your body.

   i. Push or pull an object instead of lifting it whenever possible; it is safer and easier.

   j. Share these rules with others, so that everyone will lift safely and well.

7. Answers should include three of the following:

   a. Treat geriatric patients gently.

   b. Support joints when moving a patient.

c. When helping a geriatric patient sit or lie down on a hard radiographic table, make sure that he or she is placed gently to reduce the impact on the bones.

d. Avoid sliding the patient.

e. Use a transfer sheet.

f. Protect the skin from abrasions.

Lesson 2: Assisting Patients with IVs

1. a. IV bag

   b. Tubing

   c. Drip chamber

   d. Flow control

   e. Catheter

2. a. When the backup battery is in use and begins to weaken

   b. When there is an occlusion or a blockage in the catheter or tubing

3. Answers should include two of the following:

   a. Patient complains of pain around the insertion point of the needle.

   b. Skin around the area will appear swollen.

   c. A bruise may be present.

4. Blood flows up into IV tubing when the pressure inside the vein is greater than the pressure of the column of IV fluid.

5. Patients must wear gowns so that metal buttons or snaps of the pajamas do not show up in the radiograph.

6. When the patient has an IV pump

Lesson 3: Transferring and Transporting Patients - Activity Sheet

1. Transferring refers to moving a patient from one surface to another, such as from a bed to a wheelchair. Transporting refers to moving a patient from one area to another, such as from the patient's room to the radiology department.

2. Answers should include two of the following:

   a. Independent transfer

   b. Dependent transfer

   c. Active-assisted transfer

   d. Passive-assisted transfer

   e. Stand and pivot transfer

   f. Swing transfer

   g. Sliding board transfer

3. Answers should include two of the following:

   a. Gait belt

   b. Transfer sheet

   c. Slide board

4. They can become tangled around the patient or around x-ray equipment.

5. A backboard is used to prevent further injury to the patient and should remain in place until a physician orders it removed.

6. A transfer sheet, or lift sheet, is often placed under the patient's body to help change the patient's position on the bed sheet. This transfer sheet is used to transfer the patient from one surface to another surface.

7. The radiology aide should stand at the patient's weak side to provide support.

8. a. Transporting via wheelchair

   b. Transporting via stretcher

   c. Ambulation

9. When requisitions are sent to the radiology department for procedures, the patient's mode of transport is usually listed on the form.

10. The nurse or the nurse's designee should transfer the oxygen.

Lesson 4: Assisting with Elimination

1. a. Dependent - Roll the patient to one side, opening the gown in the back and placing the bedpan against the buttocks. Roll the patient back onto his or her back. Place a small pillow or rolled towel at the top of the bedpan at the small of the patient's back. Make sure he or she is centered on the pan and the hospital gown is out of the way. Make the patient as comfortable as possible. Cover the patient with a sheet and allow him or her as much privacy as possible. Remove and dispose of gloves. Wash your hands.

   b. Patient assisted - Have the patient bend his or her knees and place his or her feet flat on the table. By pushing down on his or her feet the patient will be able to raise the hip and buttocks off the table. Make sure the gown is open in the back and slide the bedpan under his or her buttocks. A pillow may be placed under the lower back for comfort. Cover the patient with a sheet and allow him or her as much privacy as possible. Remove and dispose of gloves. Wash your hands.

2. Urinal

3. Make sure the tubing is out of the way of patients' feet when they are walking and not coiled beneath them when they are sitting or lying down. Care must be taken that a patient does not trip on the tubing and possibly fall or pull the catheter out.

Lesson 5: Assisting in an Emergency - Activity Sheet

1. a. To preserve the patient's life

   b. To prevent further problems

   c. To get proper medical help as soon as possible

2. a. Localized area of swelling in the upper respiratory tract

   b. Failure of the central nervous system

   c. Choking on an object or piece of food

3. Answers should include two of the following:

   a. Breathing sounds progressively more labored.

   b. Patient complains that breathing is becoming difficult.

   c. Lips may take on a blue or purplish cast.

   d. Beds of the fingernails may look blue.

4. Heart attacks occur when the arteries that supply the heart muscle with blood become blocked as a result of a blood clot or coronary artery disease. Cardiac arrest occurs when the heart suddenly stops beating.

5. Answers should include four of the following:

   a. Sudden intense pain in the chest around the area of the sternum

   b. Intense tightening of the chest as though a heavy weight is on the chest.

   c. Pain extending up into both sides of the neck

   d. Sharp pain extending into the left shoulder

   e. Sudden nausea

   f. Patient feels the need to have a bowel movement

6. It will reduce the chance that the patient will breath in the vomited material.

7. a. Assist the patient to lie down.

   b. Remove anything that may cause injury.

   c. Padding should be placed under the patient's head.

   d. Do not attempt to restrain or hold the patient down.

Unit III: Basic Patient Care - Written Unit Evaluation

1. d
2. b
3. d
4. a
5. c
6. d
7. a
8. a
9. b
10. c
11. d
12. b
13. a
14. d
15. c
16. c
17. b
18. a
19. a
20. c
21. c
22. b
23. d
24. a
25. c
26. b
27. d
28. b

Unit IV: Radiographic Room Responsibilities

Lesson 1: Introduction to Radiology Procedures - Activity Sheet

1. a. Long-term

   b. Short-term

2. To maintain the greatest possible distance from the x-ray source

3. Lead

4. Answers should include three of the following:

   a. Lead aprons

   b. Neck collars

   c. Leaded glasses

   d. Leaded gloves

5. Newly formed cells, such as those in a fetus, are very susceptible to the harmful effects of radiation.

6. Answers should include one of each of the following:

   a. High - Lymphatic tissue, bone marrow, reproductive cells

   b. Medium - Lens of eye, skin, salivary glands, mature bone

   c. Low - Muscle tissue, nerve tissue

7. A dosimeter measures radiation through an element that changes chemically as it is exposed to radiation. The most common dosimeter is the film badge, which is worn for a short period of time, usually one month. After one month, the dosimeter is analyzed for radiation exposure.

8. a. Posterior-anterior (P.A.) projection

   b. Anterior-posterior (A.P.) projection

   c. Lateral (Lat.) projection

9. a. Supine

   b. Prone

c. Oblique

d. Lateral

10. The chest x-ray is one of the most commonly performed exams in the radiology department. The exam is performed with the x-ray tube at a distance of 72 inches (6 feet) from the film. At this distance the heart will appear close to its actual size.

11. Kidney, ureter, and bladder

12. a. Upper GI

b. Lower GI

c. Intravenous pyelogram

Lesson 2: Assisting in the Radiographic Room - Activity Sheet

1. a. Type

b. Size

2. Answers should include three of the following:

a. 8 x 10 in. (18 x 24 cm)

b. 9 x 9 in. (24 x 24 cm)

c. 10 x 12 in. (24 x 30 cm)

d. 11 x 14 in. (30 x 35 cm)

e. 14 x 14 in. (35 x 35 cm)

f. 14 x 17 in. (35 x 43 cm)

g. 7 x 17 in. (18 x 43 cm)

3. Answers should include two of the following:

a. General radiography cassettes, which can be used for nearly any type of radiograph

b. Extremity or detail cassettes, which are used for extremeties where very fine detail is required

c. Grid cassettes, which are often used for thicker body parts (e.g., femurs, chests, and abdomens), in portable work, and with contrast media.

4. Escort the patient to the changing area. Explain which articles of clothing must be removed, usually everything except the underpants (unless a barium enema is being done; then everything must be removed). Instruct the patient to put on the x-ray gown and remain in the changing area until you return to take him or her into an x-ray room for the examination. A weak or confused patient may need assistance and should not be left alone.

5. Upper GI exam and Lower GI exam

6. The radiologist's instruction should be used to determine the thickness of the barium mixture. The mixtures should be shaken 20 to 30 seconds immediately after the water is added.

7. As a drink

8. As an enema

9. The patient must sign an informed consent form.

10. Answers should include two of the following:

    a. Angle sponges

    b. Preformed cushions

    c. Sandbags

Lesson 3: Cleaning the Radiographic Room - Activity Sheet

1. a. X-ray table

    b. Film cassettes

    c. Wheelchairs

    d. Stretchers

2. Disposable gloves

3. Gloves, goggles, a mask, and an apron

4. Germicide

5. The toweling should be disposed of in a contaminated trash container or contaminated linen bag.

6. a. Remove your apron and gloves.

    b. Place them in the contaminated trash receptacle.

c. Wash your hands.

7. Answers should include four of the following:

   a. Barium products for drinks and enemas

   b. IV contrast media

   c. Syringes and needles

   d. Alcohol prep pads

   e. Band-Aids™ and sterile and non-sterile gauze pads

   f. Emesis basins, urinals, and bedpans

   g. X-ray gowns, sheets, pillowcases, and blankets

   h. Disposable gloves and aprons

   i. Cleaning linens (clean rags or towels)

   j. Spray cleaners and disinfectants

Unit IV: Radiographic Room Responsibilities - Written Unit Evaluation

1. b
2. c
3. a
4. b
5. d
6. b
7. c
8. c
9. a
10. d
11. d
12. a
13. b
14. d
15. c
16. c
17. d
18. d
19. a
20. c
21. c
22. b

Unit V: Office Procedures

Lesson 1: Telephone Techniques and Scheduling Appointments - Activity Sheet

1. Answers should include five of the following:

   a. Answer the telephone as quickly as possible.

   b. Identify the department and yourself in the greeting.

c. Speak slowly and clearly.

d. Keep a pen or pencil and message pad next to the phone.

e. Be a good listener.

f. Establish the nature of the call, and be prepared to make note of the names, times, and phone numbers.

g. Do not be afraid to ask a caller to spell a word or name or to repeat a phone number.

h. Record messages carefully.

i. Make every effort to relay a message promptly.

j. If unsure about how to answer a caller's question, direct the call to someone who can help.

k. Follow through on any promises to fax a record or return a call.

l. Practice tact when cutting a conversation short or asking a caller to hold.

2. Get his or her name and phone number and ask, "May I have my supervisor call you back?" Immediately inform your supervisor of the situation so that he or she can be prepared to make the return call.

3. a. The day of the exam

   b. The time of the exam

4. A prep sheet

5. Your supervisor or a radiologist

6. Answers may vary.

7. Answers may vary.

8. a.

TO: Jeremy Smith

DATE: 6/1 TIME: 6:30 p.m.

BY: JKC

[X] Please return call [X] Telephoned

[ ] Will call again [ ] Returned your call

Name of caller: Dr. Jones

of: Family Health Clinic

Phone: 792-1121

Message: Re: Mattie Dunn who is scheduled for a C.T. scan of the head on 6/4. Due to her condition, the exam needs to be scheduled before 6/3. Call Dr. Jones with the new date and time A.S.A.P.

b.

TO: Supervisor

DATE: 5/24 TIME: 7:15 a.m.

BY: JKC

[X] Please return call [X] Telephoned

[ ] Will call again [ ] Returned your call

Name of caller: Mr. James Wilson

of:

Phone: 994-4646

Message: Mr. Wilson does not understand why he cannot eat lunch today. "just because he's having some test done tomorrow that he doesn't need anyway." Please call before 11:00 a.m. today.

Lesson 2: Filing Procedures - Activity Sheet

1. a. Alphanumeric

   b. Color/bar code system

2. There is potential for confusion.

3. With color/bar coding, envelopes filed out of sequence outside their color group are easily recognized. Films filed out of sequence within the proper color require personnel to search only a relatively few files to find the misplaced one.

4. a. Microfilm

   b. Digitize the radiographs and store on computer disks

5. Five to seven years after the date of the last examination

6. Radiographs of minor patients must often be kept for two years after the patient has legally become an adult, provided he or she has not been radiographed within a five- to seven-year period. If he or she has, all films are kept the same length of time as adults' records.

7. a. Active patient files are frequently retrieved and reviewed, and new information is added to them.

   b. Personnel from other facilities may request radiographs for comparison with new films.

Unit V: Office Procedures - Written Unit Evaluation

1. c
2. a
3. b
4. b
5. d
6. a
7. c
8. b
9. c
10. b
11. d
12. d
13. a

50-1141 S

Radiology Aide

Manual

Instructional Materials Laboratory • University of Missouri-Columbia
Missouri Department of Elementary & Secondary Education

Radiology Aide

Student Manual

Writers:

Jon Hartwein, BA, R.T.(R.)
St. Louis Community College
St. Louis, MO

and

John Dunham, R.T.(R.)
Arcadia Valley Hospital
Pilot Knob, MO

Technical Editor:

Ronda Wahl, Ph.D., R.T.(R.)
University of Missouri-Columbia
Columbia, MO

Veronica Feilner, Senior Editor and Project Coordinator
Sara Davis, Assistant Editor
Instructional Materials Laboratory
University of Missouri-Columbia

Produced by the
Instructional Materials Laboratory
University of Missouri-Columbia
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Available from:
Instructional Materials Laboratory
University of Missouri-Columbia
2316 Industrial Drive
Columbia, MO 65202
800-669-2465 or 573-882-2883

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Radiology Aide Advisory Committee:

Jon Hartwein, BA, R.T.(R.), St. Louis Community College, St. Louis, MO

Donna Butts, RN, BSN, Health Occupations Instructor, Mexico Area Vocational School, Mexico, MO

John Dunham, R.T.(R.), Arcadia Valley Hospital, Pilot Knob, MO

Delbert Lund, Supervisor, Vocational Planning and Evaluation, Department of Elementary and Secondary Education, Jefferson City, MO

Barbara Janzekovich, RN, Bolivar R-I High School, Bolivar, MO

Ron Ott, A.R.R.T., Fitzgibbon Hospital, Marshall, MO

Brian Flesch, BA, R.T.(R.), Radiology Department, Columbia, MO

Jane Scott, RN, BSN, Supervisor, Health Occupations Education, Department of Elementary and Secondary Education, Jefferson City, MO

Mary Sebacher, MED, R.T.(R.), University of Missouri-Columbia, Columbia, MO

Instructional Materials Laboratory Staff:

Phyllis Miller, Interim Director
Eileen Woody, Assistant Director
Dan Stapleton, Assistant Director
Veronica Feilner, Senior Editor and Project Coordinator
Sara Davis, Assistant Editor
John Williams, Assistant Editor
Kevin Gamble, Graphic Designer
Jan Trimble, Computer Support Specialist
Jill Clark, Editorial Assistant
Shelly Seabaugh, Editorial Assistant

Foreword

This *Radiology Aide* manual is designed to be used independently by students who are in secondary health occupations programs or by individuals receiving on-the-job training in the radiology department. A clinical site is needed for individuals to practice radiology aide skills and to demonstrate mastery of those skills.

This manual is divided into five units: Orientation to Radiology, Darkroom Duties, Basic Patient Care, Radiographic Room Responsibilities, and Office Procedures. Units are further divided into lessons, which contain lesson objectives, key terms, content information, illustrations, and activity sheets as appropriate for the content. Activity Sheets are designed to assist the learner in mastering the information in each lesson. The Clinical/Laboratory Activities included on the Activity Sheets should be reviewed or discussed with the instructor or clinical supervisor upon completion.

Each unit has a written evaluation, which should be taken after all lessons in the unit are studied. A score of 80 percent is needed for mastery of information in the unit. Skill Sheets provide a record for mastery of the steps of procedure for each skill. The learner should practice the skills outlined in the lessons before requesting evaluation of the skills. Not all lessons contain Skill Sheets. Your clinical supervisor will be evaluating mastery of the skills.

A Unit Checklist, located at the end of each unit, provides a method for keeping track of Activity Sheets, Skill Sheets, and Written Unit Evaluations to be completed in the unit.

The Written Unit Evaluations and Skill Sheets are included at the end of the manual. If you are taking this instruction under the supervision of an instructor or clinical supervisor, these pages may have removed from your manual. When you are ready to complete a Written Unit Evaluation or a Skill Sheet, check with your instructor or clinical supervisor.

Those using this manual on an individual basis may want to order the Instructor's Key, which provides answers to Activity Sheets and Unit Evaluations.

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Glossary

A

Active-assisted transfer - a dependent transfer in which the patient is able to help

Alphanumeric system - filing system that uses either a coded number or a set of numbers and letters before or after the patient identification number

Ambulatory - ability to walk

Artifacts - unwanted marks, densities, or blurred areas that hide detail on a radiograph

Automatic processor - the piece of darkroom equipment used to develop radiographic film

B

Body mechanics - effective use of the body to move objects or people without causing injury

Body Substance Precautions (BSP) - a consistent approach to managing body substances from all clients and esssential to preventing transmission of potentially infectious agents

C

Cardiac arrest - occurs when the heart suddenly stops beating

Cardiopulmonary resuscitation (CPR) - an artificial means of keeping blood flowing and air moving through the lungs of a patient

Cassette - the light-tight metal or plastic holder for radiographic film

Catheter - a small needle or hollow tube

Cleanup film - a piece of radiographic film that is run through the processor during start- up to pick up any foreign matter or dried chemicals from the rollers

Communicable diseases - diseases that can be spread from person to person

Contrast media - substances that cause organs or structures that would not normally be seen to show up on a radiograph

Crossover rollers - specific points at which the film makes a turn from the developer to the fixer, from the fixer to the wash, and from the wash to the dryer

D

Density - blackness of the film

Dependent transfer - a transfer in which the patient needs assistance to stand or move

Developer - a chemical that causes a reaction in the film's emulsion and darkens the film

Diagnosis - the identification of illness or injury

Dosimeter - measures radiation through an element that changes chemically as it is exposed to radiation

Double-contrast exam - an exam (lower or upper GI) in which both air and barium are used as contrast media

Drip chamber - a widened section of tubing filled approximately half full of IV fluid

E

Empathy - being able to put oneself in a patient's place and imagine what he or she must be feeling

Emulsion - the chemicals that coat the surface of the film

Entry rollers - the first set of rollers in the processor; they grab the film and pull it gently into the processor

Ethics - principles that guide a person's actions in performing his or her duties

F

Fixer - a chemical that stops the darkening of the film, hardens the film, and rinses unexposed emulsion from the film

Flashing - the process of photographically placing the date, patient's name, number, date of birth or age, and name of hospital or clinic on the film

Flow control - a piece of plastic through which the IV tube runs that controls the rate of flow of the IV solution

Fluoroscope - special kind of x-ray machine that uses x-radiation and an image intensifier to project the image onto a fluorescent screen

G

Gait belt - thick belt placed around the patient's waist and used by the aide to assist the patient in moving, transferring, and ambulating; also called a *transfer belt*

Geriatric - elderly

H

Heart attack - occurs when the arteries that supply the heart muscle with blood become blocked as a result of a blood clot or coronary artery disease

Heimlich maneuver - a method of dislodging food or other material from the throat of a choking victim

I

Imaging modalities - types of equipment or methods used to create pictures of the inside of the body

Independent transfer - transfer in which the patient is capable of standing and moving on his or her own

Infiltration - situation in which the needle or the catheter has broken through the blood vessel wall, causing the IV fluid and blood to leak out of the vein into the surrounding tissue

Informed consent form - form that explains the complications or adverse reactions that may occur from a procedure (usually those involving contrast media)

Intravenous pyelogram (IVP) - an examination of the kidneys that uses contrast medium to show how they function

IV pump - an electrical device that automatically controls the rate of flow of IV fluid into a patient

IV bag - a plastic bag filled with fluid

K

KUB (kidney, ureter, and bladder) radiograph - an exam used to determine the location and size of the kidneys

L

Lower GI - an examination of the large intestine that uses a contrast medium (or media)

M

Material Safety Data Sheet (MSDS) - a document that lists safety requirements and precautions as well as the product's composition and a phone number to call with questions

Multiloader - a machine into which film cassettes ready for processing are placed. It opens cassettes, removes the film, feeds it to the processor, reloads cassettes, closes them and returns them ready to use

N

NPO - indicates that the patient should have "nothing by mouth"

O

Occlusion - a blockage in a catheter or tubing

P

Pass box - a lead-lined, light-impermeable film cassette storage box set into the wall between the darkroom and the radiographic room

Passive-assisted transfer - a transfer in which the patient is completely dependent

Pediatric - relating to children

Personal protective equipment (PPE) - the second line of defense against infection, examples include gloves, masks, gowns or aprons, and protective eyewear

Position - refers to the placement of the body or a body part in a specific pose to achieve the desired radiograph

Preps - required preparations for all exams

Projection - refers to the direction the x-ray travels through the body

R

Radiograph - the permanent film record of the examination

Radiographer - the person who takes the radiographs; he or she receives special training in the technical aspects of producing radiographs

Radiologist - a physician who has had specialized training in radiology

Radiology - uses gamma or x-radiation to diagnose and treat injury or disease

Recirculation pumps - part of the automatic processor, they remove chemicals from the bottoms of the tanks and pump them back into the sides of the tanks under pressure to keep the chemicals well mixed

Respiratory arrest - failure of the body's respiratory system, which prevents the patient from drawing oxygen into his or her lungs

S

Scout film - the initial large radiograph that gives the radiographer an overview of the condition of the patient

Seizure - loss of consciousness followed by violent involuntary contraction and relaxation of the muscles

Signs - visible changes that can be seen in the patient, like swelling of an area or redness of a place on the skin

Slide board - used to transfer patients from one surface to another

Sternum - breast bone

Sympathy - feeling sorry for the patient

Symptoms - the patient's perception of what is happening to him or her

T

Trachea - windpipe

Transfer sheet - a sheet that is placed under the patient's body and used to help lift or move the patient

Transferring - moving a patient from one surface to another, such as from a bed to a wheelchair

Transporting - moving a patient from one area to another, such as from the patient's room to the radiology department

Tubing (IV) - connects the bag with the needle or catheter in the patient's arm or hand

U

Upper GI - an examination of the esophagus, stomach, duodenum, and small intestine or bowel that uses a contrast medium (or media)

Urinary catheter -a tube placed into the bladder through the urethra

Unit I

Orientation to Radiology

The discovery of x-rays and their potential greatly enhanced the ability of the medical team to diagnose and treat disease and injury. This unit will introduce the field of radiology. It will also describe the radiology department and how it relates to other health care units, legal and ethical concerns in radiology, and the importance of good communication between health care workers and patients.

Unit Lessons

Exploring the Field of Radiology

Legal Aspects and Professional Ethics of Radiology

Communication

Lesson 1: Exploring the Field of Radiology

Objectives:

A. Describe the scope of the radiology department.

B. Identify radiology team members and their roles.

C. Identify the role of the radiology aide.

Key Terms:

- Radiology
- Diagnosis
- Radiograph
- Imaging modalities
- Radiologist
- Radiographer

Radiology uses gamma or x-radiation to diagnose and treat injury or disease. It is a very important part of the health care process. Radiology is often the focus of the **diagnosis,** the identification of illness or injury, and provides evidence of recovery. Diagnosis is done through an examination that uses radiation to photograph various parts of the body. A **radiograph** is the permanent film record of the examination. Many people, including health care workers, refer to the exposed film as an "x-ray," but the x-ray is actually the beam that passes through the body to create the image rather than the picture itself. Prior to the discovery of x-radiation, much of the process of diagnosis involved educated guesswork and experience. The ability to see inside the human body has greatly improved health care.

The Radiology Department

The field of radiology has expanded considerably since the first use of x-rays to create pictures of the inside of the body. The modern radiology department has a wide and varied scope. It uses a variety of **imaging modalities**, types of equipment or methods used to create pictures of the inside of the body. Radiology may be part of a hospital or it may be a separate clinic with individual departments for each imaging modality. The size, number, and layout of the rooms, and the members of the staff will differ based on the size and requirements of each facility.

Diagnostic x-ray remains the most frequently used imaging modality and is, therefore, the focus of this manual. However, the radiology aide may be required to assist with other modalities, such as nucleur medicine, computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, ultrasound, and mammography. They are described below:

Nuclear medicine: The patient is injected with a radioactive substance. When this substance reaches and passes through the organ or structure of interest, a nuclear medicine camera measures and records the activity. Films similar to radiographs are usually the end result and are kept as a permanent record of the exam.

CT scans: This employs x-radiation as an imaging source. Unlike conventional radiography, the organ or structure of interest is shown in very thin slices. A computer then "reconstructs" the cross-section, and permanent films are made by a camera connected to the computer monitor.

MRI: This looks similar to CT scans, but x-radiation is not used to obtain the image. This system uses very powerful magnet

and radio waves to manipulate hydrogen atoms within the area of interest. Sophisticated computer technology creates an image on the monitor, and a permanent film can be made with a camera connected to the computer.

Ultrasound: High-frequency sound waves are used to form its images. As echoes from sound waves "bounce off" the area of interest within the body, they are used by the computer to create the image. The video of the ultrasound is used for various studies of, for example, the heart, called echocardiography, or unborn babies. Films can be made of the exams to provide permanent records.

Mammography: Mammography is a low-dose x-ray examination of the breast and surrounding tissue. It is used to detect breast cancer in its early (and more manageable) stages.

Patients come to the radiology department from a wide variety of sources. Within the hospital, patients are referred from most major departments. The orthopedics department uses radiology to evaluate problems with bones and joints. The pulmonology department uses radiology to view organs and structures of the chest (e.g., the lungs). The urology department uses fluoroscopy and radiology to examine the kidneys and urinary bladder, and gastroenterology uses various types of radiology to study the esophagus, stomach, and large and small intestines. Patients will also be sent from the emergency room. Sometimes radiographs are taken in the operating room, and if a patient is too sick to go to radiology, a portable machine can be taken to his or her room.

General practitioners also refer patients to the radiology department. Patients are often sent directly from the doctor's office to radiology. Patients who are not hospitalized at the time of their exams are referred to as outpatients.

Members of the Radiology Team

The radiology aide who works in a hospital or large clinic will interact with many health care workers, including physicians; registered nurses (RNs); licensed practical nurses (LPNs); physical, occupational, and respiratory therapists; emergency medical technicians (EMTs); and laboratory technicians. The personnel with whom the radiology aide will have the most contact though are the other members of the radiology team: the radiologist, the radiographer, the radiation therapist, the nuclear medicine technician, and the ultrasonographer. They are discussed below.

The **radiologist** is a physician who has had specialized training in radiology. He or she is often the head of the radiology department and is responsible for the smooth operation of the department and the radiology staff. Depending on the size of the department, the radiologist may look at and interpret all the radiographs taken by the staff. He or she usually makes the diagnostic decision and writes the final report on a patient's examination results.

The **radiographer** takes the radiographs. He or she receives special training in the technical aspects of producing radiographs. The radiographer is responsible for the daily operations of the equipment and has routine protocols to follow when taking radiographs. The radiographer may receive additional instructions from individual physicians or the radiologist.

The radiation therapist, nuclear medicine technician, and ultrasonographer are all radiographers who have had additional specialized training. The equipment they use is specially designed and often

functions differently than regular x-ray equipment. Not all radiology departments will have all of the specialists on staff. Figure 1.1 shows the minimum educational requirements for radiology team members.

The Role of the Radiology Aide

The radiology aide will assist any and all members of the team as they go about producing high-quality diagnostic studies. He or she must remember that maintaining a professional appearance and manner is important for every member of the radiology team. The aide should be neat and clean in appearance and possess good communication skills. He or she should be courteous, punctual, honest, energetic, and willing to learn a variety of tasks. Above all, the radiology aide must be focused on providing good patient care.

The radiology aide's duties include transporting patients, setting up or preparing rooms for exams, developing radiographs, restocking materials, and cleaning and maintaining equipment. Since the radiology aide is often the person with whom patients in the radiology department have first contact, good communication and public relations skills are essential. The aide who greets patients pleasantly and treats them kindly instills

Figure 1.1 - Educational Requirements for Radiology Team Members

TITLE	EDUCATION	DESIGNATION
Radiologist	4 yrs. college (bachelor's degree) 4 yrs. medical school 5 yrs. residency 1 yr. specialty (desired)	M.D. or D.O.
Radiographer	4 yrs. college (bachelor's degree) *or* 2 yrs. community college* *or* 2 yrs. radiography training** (pass board exam)	B.S.R.T. (R) A.A.S.R.T.(R)* R.T.(R)
Radiation Therapist	4 yrs. college (bachelor's degree) *or* 2 yrs. radiography training** *plus* 1 yr. certification training (pass board exam)	R.T.(T)
Nuclear Medicine Technician	4 yrs. college (bachelor's degree) *or* 2 yrs. radiography training** *plus* 1 yr. certification training (pass board exam)	R.T.(NMT)
Ultrasonographer	2 yrs. radiography training *plus* 1 yr. certification training (pass board exam)	RDMS
Radiology Aide	High school diploma (health occupations/radiology aide course desired)	

* Associate of Applied Science
**Certificate

confidence in patients and other health care workers. The radiology aide should be aware of how dependent other medical professionals are on the exactness and consistency of the work accomplished within the radiology department.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Exploring the Field of Radiology

Activity Sheet

1. What is radiology?

2. What is an x-ray?

3. List five imaging modalities.

   a. _____

   b. _____

   c. _____

   d. _____

   e. _____

4. Explain the difference between diagnostic x-ray, ultrasound, and magnetic resonance imaging.

   _____

   _____

   _____

5. List four areas from which patients might be referred to the radiology department.

   a. _____

   b. _____

   c. _____

   d. _____

6. What are the duties of the following radiology professionals?

   a. Radiologist: _____

   _____

   _____

   b. Radiographer: _____

   _____

   _____

   c. Radiology aide: _____

   _____

   _____

Clinical/Laboratory Activities

1. At your clinical site interview two different types of radiology professionals. Be sure not to interfere with their work schedules. Write a brief explanation of their duties and the educational requirements for the jobs.

2. Get (or draw) an organizational chart of your clinical site. Write short answers to the following questions:

   a. What other departments are closely aligned with the radiology department? Why do you think they are organized in that manner?

   b. Does it physically connect with the other related departments, organizations, specialties, etc.? If so or if not, why do you think the facility was designed that way?

3. Discuss the various imaging modalities at your clinical site with your clinical site supervisor. Which modalities are used? Which modalities are not available? How does this affect patient care?

Lesson 2: Legal Aspects and Professional Ethics of Radiology

Objectives:

A. Differentiate between legal and illegal acts and ethical and unethical decisions.

B. Respond appropriately to clinical situations.

Key Terms:

- Ethics

The radiology aide will interact with many people in the course of an average day--patients, their families, and other health care workers. How the aide should handle these interactions is largely determined by laws and ethical standards of professional conduct.

Legal and Ethical Decisions and Actions

Legal Aspects

In the health care environment, as in any business, laws dictate specific rules and regulations that must be strictly followed. Laws are divided into two basic categories: criminal and civil. A criminal act is a crime against society, for example, assault. A violation of civil law involves infringing upon a person's private rights as a citizen, for example, sexual discrimination. Some examples of illegal acts that might occur in a radiology department follow.

- Performing radiographic examinations without a physician's order.
- Stealing supplies, e.g., taking a pair of disposable gloves for use at home.
- Performing an intravenous (IV) contrast exam on a patient without his or her consent. (The patient or legal guardian must read and sign an informed consent form.)
- Altering a medical record.
- Causing injury to a patient through negligence.

Ethics

Ethics are a code or set of principles that guide a person's actions in performing his or her duties. At work, as well as in private life, people use these principles to determine moral behavior. Ethics are not necessarily the law. A radiographic professional can act unethically without breaking any laws. A decision is ethical if:

- It enhances self respect,
- It develops personal integrity and integrity in relations,
- It builds genuine confidence in oneself and others, and
- It maintains confidentiality and exhibits respect.

A decision is unethical if:

- It brings harm to others,
- It causes an illegal action,
- It causes people to be exploited or belittled, or
- It treats people as objects.

Some examples of unethical actions that might occur in a radiology department follow.

- It is unethical for a radiographer or radiology aide to interpret radiographs for patients. A radiographer should never perform an exam and then offer a diagnosis to the patient.
- It is unethical for the radiology aide to discuss a patient's illness with other people who are not involved in the patient's care.
- It is unethical for the radiology aide to work outside the scope of his or her training and experience.

The American Registry of Radiologic Technologists (ARRT) sets conduct guidelines for people working in the field of radiology. Figure 2.1 provides a summary of the organization's code of ethics.

Responding to Clinical Situations

Confidentiality

Health care workers routinely see personal information about patients and their families. That information is confidential; workers are not supposed to reveal information to anyone who is not involved with an individual patient's care. Even family members must be referred to the attending physician for any information about the patient's condition and treatment. The radiology aide should remember that a patient's trust in the radiology department must never be violated. The well-being of the patient and the entire staff is dependent upon maintaining the confidentiality of all patient information.

Figure 2.1 - Code of Ethics

1. Be professional; patient care is the highest priority.
2. Do not discriminate; treat all people with all kinds of diseases respectfully.
3. Strive to advance the profession by respecting people's dignity.
4. Practice what you have learned; radiation safety and good diagnostic studies are the goals.
5. Act in the best interest of the patient.
6. Work with the goal of helping physicians to diagnose, but diagnosis is beyond the scope of the radiographer.
7. Use accepted standards of practice; limit radiation exposure to everyone.
8. Act ethically and protect patients' rights.
9. Respect confidences; reveal confidential information only as required by law or for the good of the public.
10. Continue to improve your knowledge and skills through education and training.

Even when discussing patients or cases with appropriate personnel, the radiology aide should be aware of whether the conversation might be overheard by the public. Maintaining the confidentiality of patients' medical records is the legal and ethical responsibility of all health care workers.

Incident/Occurrence Reports

Any time an injury occurs to a patient or a staff member on duty, the incident must be reported. Even if the injury seems slight or insignificant, the radiology aide must document it and turn the report in to his or her immediate supervisor. Errors in administering treatment to a patient should also be brought immediately to the attention of the person in charge and documented. Who was involved, what happened, and when and where it occurred should be included in the report. Only the facts should be documented. It is not appropriate to imply blame or guess what happened. In reporting an apparent fall by a patient, for example, the radiology aide would state, "Mr. Jones was found on the floor by the x-ray table," not "Mr. Jones tried to get off the cart by himself, climbed over the rail, and fell on the floor by the x-ray table."

The incident/occurrence report should be signed by all the parties involved, and a follow-up by the supervisor is required under most circumstances. If an injury to a patient has occurred, the follow-up involves contacting the patient at some later date to determine if he or she requires further medical care for the injury. If not appropriately handled, a seemingly minor injury or harmless incident can become a serious legal issue. When that happens, it is crucial that the incident be well documented. The radiology aide should always notify his or her supervisor of any incidents and complete the report required by the department.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 2: Legal Aspects and Professional Ethics of Radiology

Activity Sheet

1. List three guidelines that can help you decide if a decision is ethical.

   a. _____

   b. _____

   c. _____

2. List three guidelines that can help you decide if a decision is unethical.

   a. _____

   b. _____

   c. _____

3. List three ethical standards adopted by the American Registry of Radiologic Technologists.

   a. _____

   b. _____

   c. _____

4. List two examples of unethical actions in radiology.

   a. _____

   b. _____

5. List three examples of illegal actions in radiology.

   a. _____

   b. _____

   c. _____

6. With whom may the radiology aide share information about a patient's condition or treatment?

7. Imagine that you and another radiology aide are transferring Mrs. Smith, an 84-year-old woman, from a wheelchair to an x-ray table. She "turns" her right ankle while stepping onto the footstool. Mrs. Smith cries out in pain the instant she turns the ankle, but a minute later she says there is no pain at all and she is fine. Her right ankle does appear to be slightly swollen on the outside (lateral aspect). After she is comfortable on the x-ray table, you leave the room to notify the supervisor. Mrs. Smith does not complain of any pain. The radiographer completes the radiographs, and the supervisor informs everyone involved that the patient's physician was notified, by telephone, of the incident. Her physician felt that no further treatment was required at the time. Mrs. Smith was allowed to return to the nursing home (Pine Valley), and the physician stated she would follow up the next day. With the information provided, write a report of the incident.

Clinical/Laboratory Activities

1. Obtain an incident/occurrence report form from your clinical site. If there are several clinical sites used for your class, compare forms with your fellow classmates. Which one do you think is best? How do they differ? Write a short summary of your findings.

2. Ask your clinical site supervisor if there is a code of ethics published for the personnel working there. If so, review the material and write down the general "rules." How do they differ from the code of ethics in this lesson? Write a short summary of your findings.

Lesson 3: Communication

Objectives:

A. Greet and direct radiology patients.

B. Identify effective approaches for communication with patients.

C. Identify communication techniques that facilitate the cooperation of the pediatric patient.

D. Identify communication techniques that facilitate the cooperation of the geriatric patient.

E. Identify communication techniques that facilitate the cooperation of the confused patient.

Key Terms:

- Empathy
- Sympathy
- Pediatric
- Geriatric

The ability to communicate with patients of various ages and backgrounds is a very important quality in a radiology aide. Each patient presents his or her own special set of circumstances and needs. As the radiology aide gains experience and confidence, the job becomes more rewarding. An aide who communicates effectively with patients contributes much to the smooth and efficient operation of the radiology department.

Greeting and Directing Radiology Patients

Effective communication with patients is the cornerstone of an efficient radiology department. Patients often form lasting opinions of the department and of the hospital or clinic as a whole based on their first impressions. A negative perception is difficult to overcome, so it is important to treat all patients with dignity and respect.

When greeting and directing patients in the radiology department, make and maintain eye contact with each patient. Speak clearly and at a comfortable volume. Instruct each patient where he or she is to wait for the examination. Cheerfully help patients who need assistance to get to the waiting area. Do not tell a patient that he or she will be helped "right away" if that is not the case.

Communicating with Patients

People communicate with body language as well as speech. Remember to keep both your facial expressions and your tone of voice pleasant. If you can put patients at ease with your manner, they will be more cooperative with the rest of the radiology staff. Not all patients will be easy to deal with. Some may come to the department too early for a scheduled exam. The wait may then be longer than anticipated, causing them to become irritable. Some patients will arrive late for scheduled exams and have to be reworked into a busy schedule. Many patients feel anxious and concerned about the diagnosis that could result from the exams to be performed in radiology. Some patients will be in pain. The radiology aide must develop **empathy** for patients, put him- or herself in each patient's place and imagine what he or she must be feeling. Simply feeling sorry for the patient, which is **sympathy,** can be

counterproductive, making it difficult for the radiology aide to do his or her job.

Communicating instructions to patients on how to prepare for examinations will be the job of the radiology aide in some departments. Be sure the patient comprehends the instructions. It is essential that a patient understands how to adequately prepare for many specialized tests, such as exams of the digestive and urinary systems. If the patient does not properly prepare, the entire procedure may have to be rescheduled. If you cannot answer a patient's question about preparing for an exam, do not hesitate to ask the supervisor or a radiographer to speak to the patient. Informed patients, those who know what to expect, can cooperate during the exam and assist the radiology staff to get the best results. Always be honest with patients. Do not make promises you cannot keep.

Communicating with the Pediatric Patient

Clear communication is particularly important with children, or **pediatric** patients. Children are often frightened by simply being in the strange environment of the radiology department. They may also be fearful of adults they do not know. Before you can communicate instructions to young patients, you must gain their trust. Sitting next to a child or squatting at the child's level and making eye contact with him or her will make you seem more friendly and child-size.

Pediatric patients may expect the examination to hurt. Explain that most x-ray exams do not hurt. For example, a simple chest x-ray or exploratory abdomen x-ray are painless under most circumstances. However, do not tell a child that an exam will not hurt if you know that it might. Sometimes it is necessary to position a sore body part, which can be painful. As with all patients, honesty is the best policy. Praising children for their courage helps them relax, feel more comfortable, and leave the radiology department feeling positive about the experience.

Hospitals that have many pediatric patients and a high volume of pediatric radiology, often decorate x-ray rooms with bright colors and children's themes. A comfortable waiting area with toys and a television tuned to a station geared for kids helps distract children from the upcoming x-ray procedure. In any hospital, if a child brings a special toy along to radiology, he or she should be allowed to take it into the x-ray room. The presence of the familiar toy may help the child feel more secure. Stickers are a nice reward for children after examinations are complete. Coloring books that explain what happens in the radiology department are useful teaching tools and can be taken home to show friends or siblings.

Decisions about whether to allow a parent into the radiology room must be made on an individual basis by the radiographer. Some children will behave appropriately only with parents present. Others will not cooperate with staff until the parents leave the room. Remember to be be tactful when working with parents. They are often as upset as the children. Whenever parents are not allowed in the room with their child, assure them that their child will not be left alone during the procedure, and keep your word.

Communicating with the Geriatric Patient

The **geriatric** or elderly patient is often encountered in the radiology department.

Most elderly patients prefer to be as independent as possible. When preparing a geriatric patient for an exam, the radiology aide should tell him or her the best position for the exam, demonstrate, and then allow the patient to try, only offering assistance if it is needed. The aide should allow the patient plenty of time and offer encouragement with such comments as "Thanks a lot. You did a great job helping us get good pictures."

Poor vision and hearing loss are common barriers to communication among the geriatric population. If a patient wears glasses, be sure he or she puts them on. If a patient is wearing a hearing aid, be sure it is turned on. Changing the tone of your voice is often more effective than talking loudly to a patient who is hard of hearing. Low tones work best. Do not assume that because the patient is elderly he or she is hard of hearing. Patients who have no hearing deficit will be offended if you speak loudly to them when they can hear you well at a normal volume.

Remember that during head or neck examinations, patients cannot wear glasses or hearing aids. Be sure patients have no further questions before asking them to remove their glasses and/or hearing aids. Return them promptly when exams are complete.

Communicating with Confused Patients

Special care must be taken with confused patients. Radiology frequently receives patients who are confused or disoriented. The patients may be any age. Trauma to the head can cause disorientation; some diseases, Alzheimer's, for example, can cause changes in the brain affecting motor skills or memory.

The confused or unconscious patient must never be left alone. Call for help if you must leave the patient for any reason. Remain calm and reassure the patient. Most confused patients will respond to your manner by becoming calmer themselves. Break instructions down into small steps. Do not overload the patient with information. Be prepared to repeat information several times for a confused patient. Confused patients may be slow to respond, so allow them plenty of time.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheets, you may take the written evaluation for this unit. A score of at least 80 percent indicates you may proceed to the next unit.

Lesson 3: Communication

Activity Sheet

1. What information should the radiology aide give a patient when he or she arrives in the radiology department?

2. Explain the difference between empathy and sympathy. Which is more effective for the radiology aide?

3. What should you do if you do not know the answer to a patient's question about an exam?

4. List three communication techniques to use with pediatric patients?

   a. _____

   b. _____

   c. _____

5. List three communication techniques to use with geriatric patients?

   a. _____

   b. _____

   c. _____

6. List three communication techniques to use with confused patients.

   a. _____

   b. _____

   c. _____

Clinical/Laboratory Activities

1. Discuss with a staff member the type and number of radiology patients that are treated at your clinical site. What special provisions does the department or clinic employ for pediatric patients, geriatric patients, and their family members? Write a summary of your findings.

2. Discuss with your clinical site supervisor the methods he or she has used successfully to interact with the various types of patients described in this lesson. Develop scenarios involving different barriers to communication that an aide might encounter among patients, such as hearing loss, failing eyesight, and confusion. Use your imagination and observations at your clinical site to make up realistic situations. Have class members respond to the situations. If the class is large enough, act out the scenarios you developed and discuss various outcomes with your classroom instructor and other health occupations students.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet: Exploring the Field of Radiology Rating _____

Comments: _____

_____

Activity Sheet: Legal Aspects and Professional Ethics of Radiology Rating _____

Comments: _____

_____

Activity Sheet: Communication Rating _____

Comments: _____

_____

Written Unit Evaluation Score _____

Additional Comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit II

Darkroom Duties

The darkroom is an important area in the radiology department and one where the aide can make a significant contribution to the department's operation. The aide who can perform vital darkroom tasks independently will enhance overall team effectiveness.

This unit will cover the basics of darkroom safety, setting up the film processor, cleaning and maintaining the processor, and patient film identification.

Unit Lessons

Preparing the Darkroom

Processing Radiographs

Lesson 1: Preparing the Darkroom

Objectives:

A. Identify parts and functions of the processor.

B. Prepare processor for operation.

C. Maintain darkroom integrity.

D. Restock film.

Key Terms:

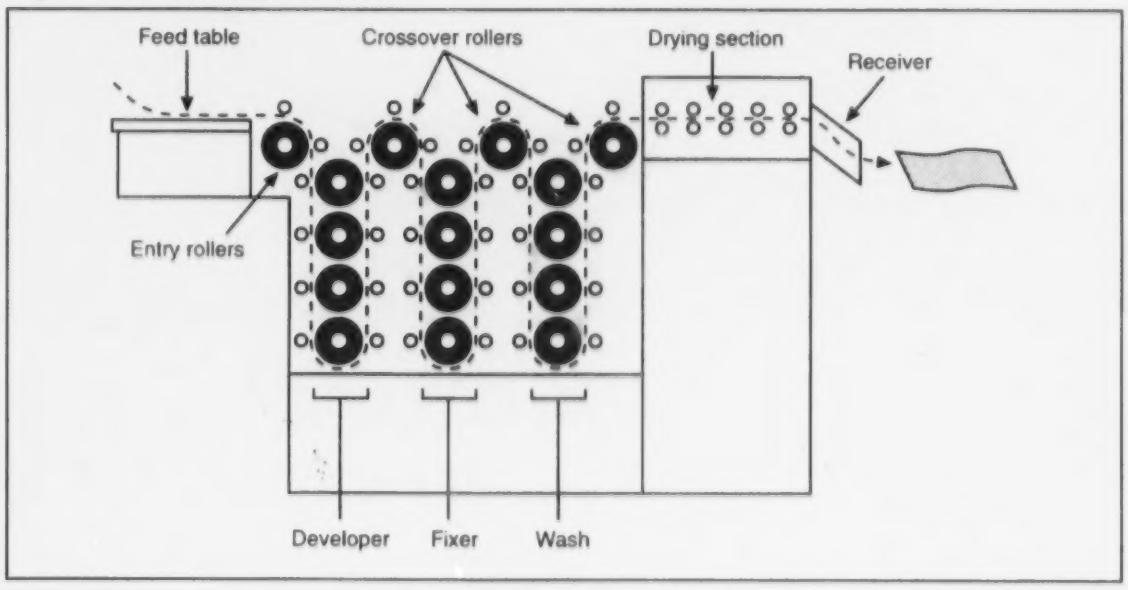
- Automatic processor
- Entry rollers
- Crossover rollers
- Developer
- Emulsion
- Fixer
- Material Safety Data Sheet (MSDS)
- Replenishing pumps
- Replenishing tanks
- Artifacts
- Recirculation pumps
- Cleanup film
- Pass box
- Safelights

The darkroom is where the radiograph is produced. Since a patient's treatment may depend on what appears on the radiograph, the utmost care must be taken to see that film is processed correctly. A machine does the work of processing, and frequently the aide must ready the machine for operation. Other steps in preparing the darkroom for a day's examinations include checking darkroom integrity, restocking film, and cleaning film cassettes and screens.

Processor Parts and Functions

The **automatic processor** is a machine that develops film. It is a complex system of mechanics, electronics, chemistry, and film. All of the elements must function together to produce a quality radiograph. The most important advantage of automa-

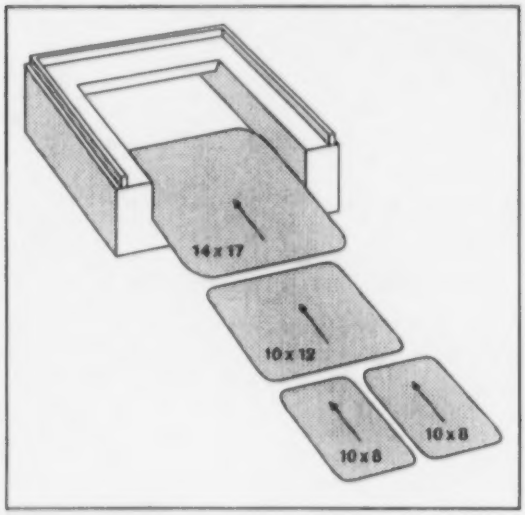
Figure 1.1 - The Film Processor



tic processing is its speed. A processor can produce a finished radiograph in three minutes. Many new processors can produce a film in ninety seconds.

Figure 1.1 shows the basic parts of a processor and the path the film takes through them. The film to be processed is placed in the feed tray and guided into the processor. The processor's **entry rollers** grab the film and pull it gently into the processor. Figure 1.2 shows the proper way to place film in the processor. A series of rollers then transports the film through the developer solution, the fixer solution, and the water bath to the dryer. Notice the specific points at which the film makes a turn from the developer to the fixer, from the fixer to the wash, and from the wash to the dryer. The rollers at these points are called **crossover rollers**. (Each individual roller is made up of a metal rod with rubber "doughnuts" at both ends.)

Figure 1.2 - Placing Film in the Processor



The **developer** causes a reaction in the **emulsion** (the chemicals that coat the surface of the film) that darkens the film. The **fixer** stops this process, hardens the film, and rinses unexposed emulsion from the film. The water bath removes any chemicals that may be left on the surface of the film. The developer and the fixer are in different tanks, but some of one chemical will sometimes get into the other. If developer gets into the fixer, it will slow the action of the fixer. This will result in radiographs that do not dry completely and feel sticky or tacky when they come out of the processor. If the fixer gets into the developer, it will slow the action of the developer. Then films will not develop properly. They will be lighter than they should. If they are too light, exams may have to be repeated.

Preparing the Processor for Operation

Caution: When working with the processor, you will be handling chemicals. X-ray developer is a chemical base, and the fixer is a chemical acid. *Both solutions are corrosive, so be very careful not to spill or splash either liquid.* You should wear gloves and eye protection as well as a plastic apron to protect clothing. While they will not eat through clothing, developer will leave a brown stain. Read the **Material Safety Data Sheet (MSDS)**, which lists safety requirements and precautions as well as the product's composition and the number to call with questions. The MSDS for each chemical should be posted on or near the processor. See the sample MSDS in Figure 1.3.

1. Put on gloves, eye protection, and apron.

2. Remove top and sides of processor.

3. With processor off, <u>remove the crossover rollers</u> from the machine. As you take them out, put them down on the counter in order so that you will know which roller is which.

Figure 1.3 - Sample Material Safety Data Sheet

Material Safety Data Sheet

Any Chemical Company · 500 Anywhere · USA 00000-0000 — Emergency Telephone No.: 1-800-000-0000

"The information herein is given in good faith, but no warranty, expressed or implied, is made" — *Date Prepared: April, 1996*

SECTION I

Chemical Name and Synonyms: Providone Iodine Solution USP, PVP-I

Trade Name: Iodine Solution (10% Providone Iodine = 1% Available Iodine)

Chemical Family: Polymer, complex of Polyvinylpyrrolidone with iodine

Formula: (C_6H_9NO) n x I

CAS Registry No.: 0000.00

SECTION II: INGREDIENTS

Name	Percent (%)	TLV	Toxicological Data
Providone Iodine USP	10.00	*	Mouse, Oral LD_{50}>8100mg/kg Rat, IV LD_{50}>540mg/kg
Glycerin	1.25		
Igepal	.30		
Purified Water	88.45		

No component is listed by NTP or IARC — Not Established as having Carcinogenic Potential

SECTION III: PHYSICAL DATA

Specific Gravity: (25°C) 1.025 — **pH:** <6.0

Appearance & Odor: Reddish brown, clear liquid, faint odor

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

Flashing Point (method used): Not flammable — **Flammable Limits:** None

LEL: n/a — **UEL:** n/a

Extinguishing Media: n/a

Special Fire Fighting Procedures: n/a — **Unusual Fire & Explosion Hazards:** None

SECTION V: HEALTH HAZARD DATA

Threshold Limit Value: None established by OSHA or ACGIH

Effect of Overexposure: This product is generally recognized as safe when used as a logical antimicrobial agent. Prolonged exposure to wet solution may cause local irritation to the skin. Elevated concentrations of iodide in the serum may occur if excessive amounts of iodine are absorbed through broken skin, burns, or deep wounds. Iodine may also be absorbed through the lungs and from the gastrointestinal tract. High concentrations of iodide in the serum may produce alterations in thyroid, renal disturbances, acidosis and electrolyte disturbances.

Emergency and First Aid Procedures:

For Eyes: Immediately wash with running water for 5 minutes. Get medical attention if irritation persists.

For Skin: Avoid prolonged contact with excess wet solution. If irritation develops, get medical attention.

For Ingestion: If swallowed, DO NOT INDUCE VOMITING. Drink several glasses of water or milk. Obtain immediate medical attention.

For Inhalation: If fumes cause respiratory discomfort, move to fresh air. Get medical attention if respiratory discomfort persists.

SECTION VI: REACTIVITY DATA

Stability: Stable — **Storage:** Store at room temperature.

Incompatibility: Not stable toward reducing agents or strong alkalies.

Hazardous Decomposition Products: None

Hazardous Polymerization: Will not occur

Conditions to Avoid: None

Type: Iron; can discolor gold or silver

SECTION VII: ENVIRONMENTAL DATA

Steps to be Taken in Case Material is Released or Spilled: Spills should be cleaned up as soon as possible, wash affected area with dilute ammonia or dilute sodium thiosulfate solution and copious quantities of water.

Waste Disposal Method: Do not discharge more than minute quantities into waterways or sewer systems. Neutralize with sodium thiosulfate prior to disposal.

Hazardous Substance Under "Superfund": No

Container Disposal: In a similar manner as other plastic bottles.

SECTION VIII: SPECIAL PROTECTION

Respiratory Protection (Specify type): n/a — **Protective Gloves:** n/a

Ventilation: **Local Exhaust:** n/a

Mechanical (General): n/a — **Other:** n/a

Eye Protection: n/a — **Other Protection Equipment:** n/a

SECTION IX: SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storage: n/a — **Other Precautions:** n/a

National Fire Protection Association (NFPA)

Rating Degrees of Hazard:

4. While the top is off and the crossover rollers out, inspect the levels of chemicals in the tanks. The levels of developer and fixer should be even with the fill lines in the tanks. If either level is low, add some fresh chemical from the appropriate replenishing tank. The **replenishing tanks** hold the fresh developer and fixer used to replace chemicals the processor has used. When the processor is running, chemicals lost during processing will be automatically replenished by the **replenishing pumps**. Some may be used at the end of the day or lost to evaporation, and they must be checked and replenished by hand. Be careful when replenishing that you do not add the wrong chemical to one of the tanks.

5. Clean the rollers in running water, and wipe them with a clean cloth. Replace them in the processor. Be sure to put them in their proper places. While the developer crossover roller may fit in place of the fixer crossover roller and vice versa, reversing them could have an adverse effect on film processing. Even though the rollers have just been cleaned, residual chemicals may remain on them and could cause cross-contamination.

6. Wipe down the feed tray, or feed table, with a clean, damp cloth before start-up to remove any particles of dust or other matter that could be picked up by a piece of film. If the tray is not clean, static electricity discharges may occur as the film passes over the feed tray. These discharges can create **artifacts**, or unwanted marks, densities, or blurred areas that hide detail on the film, making accurate diagnosis impossible.

7. After the crossover rollers and feed tray have been cleaned, visually inspect the replenishing tanks. If the levels are low (generally fewer than five gallons), solution should be added to the tanks. If the facility gets chemicals from a service company, report the low tank to your supervisor so that he or she can call for more chemicals. If the department stores premixed chemicals, add some to the tanks at this time and report how much was added to the supervisor.

8. Before replacing the lid on the processing section, turn the processor on and verify that the recirculation pumps are operating. To do this, look at the surface of the developer and fixer. You may have to raise the crossover rollers to see into the tanks. If the solutions are moving, the pumps are operating. If they are not moving, notify the supervisor. The **recirculation pumps** remove chemicals from the bottoms of the tanks and pump them back into the sides of the tanks under pressure to keep the chemical well mixed. Without the pumps, the chemicals tend to lie in the tanks in layers from active to exhausted, like the oil on top of the vinegar in a bottle of salad dressing. When this happens, the films that moves through the processor do not develop or fix properly.

9. If the recirculation pumps are functioning, replace the lid on the processor. Allow the processor time to warm up. When the processor is ready for operation, it will automatically settle into "standby" mode. The developer solution temperature will stabilize. Most modern processors will display the temperature of the developer in a digital readout on the front of the machine. The developer should be 35°C (95°F). *Do not run any film*

through the processor until it has warmed up.

10. Run cleanup film. **Cleanup film** is a piece of radiographic film that is run through the processor to pick up any foreign matter or dried chemical from the rollers. The basic steps for running film through the processor follow.

    a. Be sure the white lights are off. Take a piece of 14 x 17 film from the film bin. (For more information on film sizes, see unit IV, lesson 2.)
    b. Close the film bin and expose the film briefly to white light.
    c. Place the film on the feed tray and push it gently into the processor until you feel the entry rollers grab the film and begin pulling it in. When the film emerges from the processor, it will be black. **Caution:** Do not pull the film out of the dryer. Wait until it drops out on its own. Pulling the film from the dryer can cause scratches on the surface and can also dislodge the dryer rollers. If the dryer rollers come out of their holders, film cannot move through them, and the processor will jam.
    d. After the film leaves the processor, inspect both sides of the film. Look for scratches and dried chemical residue. The chemical residue will look like tiny white flakes stuck firmly to the film.
    e. If there is chemical residue on the film, run another cleanup film.
    f. Run cleanup film up to three times. If, after the third time, there is still chemical residue on the film, the rollers in the processor are quite dirty, and the machine requires extensive cleaning. Notify your supervisor.

Before leaving the darkroom, wipe a clean, damp cloth over all work surfaces.

Maintaining Darkroom Integrity

Darkroom integrity must be maintained to avoid accidentally exposing film. Light may enter the room through any space around the door, the processor, the safelights, or the passbox.

A **pass box** is a lead-lined, light-impermeable film cassette storage box set in the wall between the darkroom and the radiographic room. (See Figure 1.4.) The pass box has interlocking doors so that only one side of the box can be opened at a time to prevent light from entering the darkroom. Freshly loaded film cassettes are placed in order by size into the "unexposed" compartment of the pass box from the darkroom side. After a film has been exposed, it is placed into the "exposed" compartment of the pass box for processing.

Figure 1.4 - Pass Box

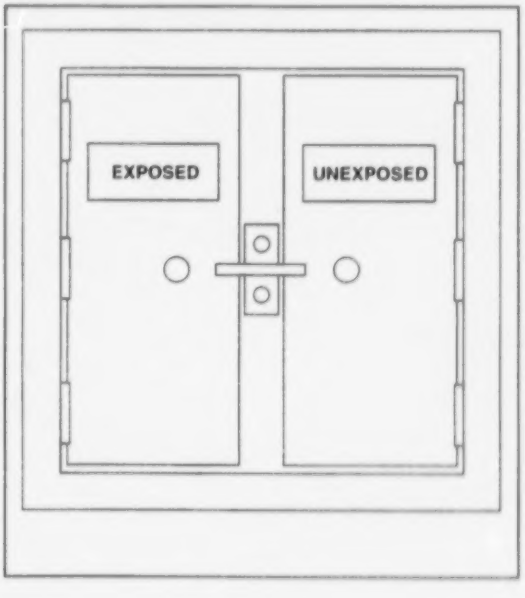
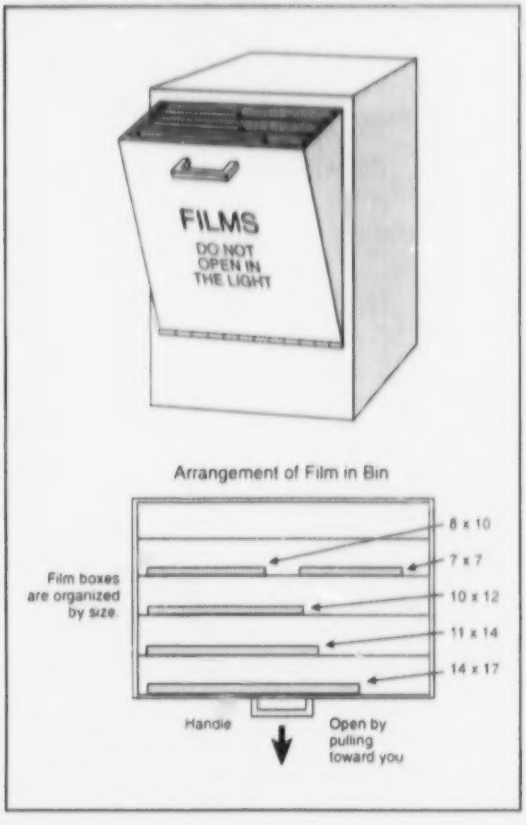


Figure 1.5 - Film Bin



Darkroom integrity should be checked on a daily basis. To test for light, go into the darkroom and follow these steps:

1. Close the darkroom door.

2. Turn off the **safelights**, lights that have a red filter and will not damage unexposed film, so that the room is completely dark.

3. Allow your eyes time to adjust to the dark, and then look around the edges of the door, the pass boxes, and the processor to make certain there are no light leaks.

4. If white light is visible anywhere, repair the leak immediately. Seal the leak with a strip of duct tape as a simple, temporary solution.

5. Turn the safelights on and check around their edges for white light.

6. Report any light leaks to your supervisor so that maintenance can be notified and the problem corrected.

Restocking Film

After assuring darkroom integrity, open the film bin and check to be sure it is well stocked with film. Figure 1.5 shows a typical film bin and the arrangement of the various film sizes in it. If any of the slots are empty, fill them with new boxes of film. Most departments stock extra boxes of film. After restocking film, notify your supervisor as to how many boxes of what film were taken from storage so that an accurate inventory may be maintained.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Preparing the Darkroom

Activity Sheet

1. Briefly describe the purpose of entry rollers, crossover rollers, and recirculation pumps.

2. What solution is contained in each of the three tanks inside the processor?

   a.

   b.

   c.

3. Why must dust be wiped from the processor's feed tray?

4. What is cleanup film?

5. What do white flakes on the cleanup film indicate? What should you do if white flakes are found on the cleanup film?

6. List three places where light may leak into the darkroom.

   a.

   b.

   c.

7. What may you use to temporarily seal a light leak?

8. How often should you restock film?

9. What types of artifacts appear on radiographs?

Clinical/Laboratory Activities

1. Have your clinical supervisor give you a tour of the darkroom and point out the location of the film bin, pass box, safelight switch, replenishing tanks, and supplies. With your clinical supervisor, learn how to open the top and sides of a radiographic processor. Then locate the following items:

   a. Entry rollers
   b. Crossover rollers
   c. Developer tank
   d. Fixer tank
   e. Wash tank
   f. Dryer section

2. Ask your clinical supervisor to demonstrate how to prepare the processor for operation. Then, with your supervisor's permission, practice the techniques.

3. With your supervisor's permission, practice testing darkroom integrity.

4. With your supervisor's permission, restock the film bin.

Lesson 2:
Processing Radiographs

Objectives:

A. Flash radiograph with patient identification.

B. Process radiographs.

C. Reload and clean cassettes.

D. Match radiographs with correct jacket and requisition.

Key Terms:

- Flashing
- Multiloader
- Density

Before films can be processed, patient information must be added to them. The radiology aide will be involved in properly identifying the radiographs, processing them, and correctly matching them to their jackets and requisitions.

Flashing

Flashing is a term used to describe the process of photographically placing the patient's name, number, date of birth or age, date of exam, and name of the institution on the film. The film will become part of a permanent record, and the flashed information is vital in identifying it as belonging to a specific patient. Figure 2.1 shows a flash card.

Flashing a film may be accomplished in two ways: a film identification printer or an identification camera.

Flashing with Identification Printer

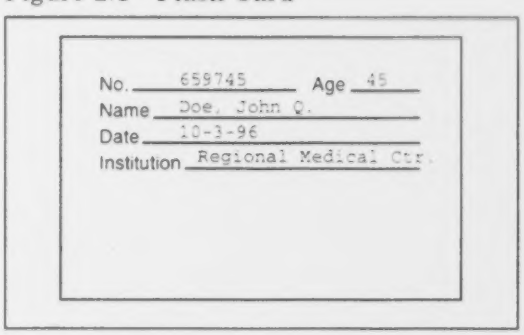
1. Inside the darkroom, remove the film from the cassette. Open the cassette as though it were a book. Reach in and grasp a corner of the film with your thumb and forefinger. Never *grab* the film in the middle. It will cause the film to wrinkle, leaving small black artifacts, shaped like half-moons, called "claw marks."

2. Place the flash card in the top slot of the printer.

3. Place the corner of the film that was under the window of the cassette in the bottom of the printer.

4. When both the flash card and the film are in place, firmly press down on the top of the printer. This will activate a light and photograph the card on the film. An indicator light will flash to show that the printer is operating. If the indicator light does not come on, check the film after it comes out of the processor. If the film is flashed, the indicator light on the printer is probably burned out, and the printer may still be used. If the film is not flashed, the light used to create the image in the printer is burned out. In either case, notify the supervisor of the problem.

Figure 2.1 - Flash Card



Flashing with Identification Camera

Films may also be flashed with an identification camera. Figure 2.2 shows flashing film using an identification camera. This device works somewhat differently from the printer, but the result is the same. The identification camera does not require you to remove the film from the cassette. This is done automatically while the film is in the cassette. If flashing a radiograph with an identification camera, use the following steps:

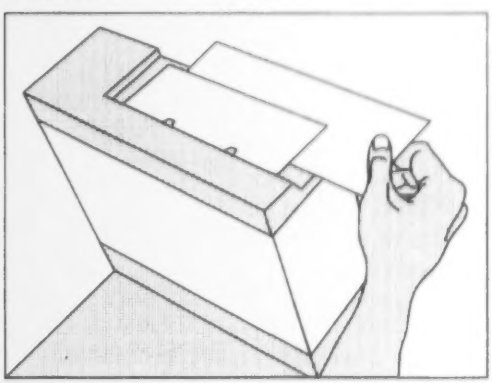
1. Slide the flash card with the printed side down into the slot on top of the camera.

2. On the back of the cassette is a metal slide called a window. Place the cassette with the window facing up into the bottom slot of the camera. The camera will open the window, expose the film, and then close the window.

3. Watch for a light on the top of the camera to come on, indicating that the camera is operating properly.

4. Remove the cassette.

Figure 2.2 - Flashing with an Identification Camera



Processing Steps

Once the films have been flashed, they are ready to be developed.

1. Take the cassettes into the darkroom and place them on the counter. (Tip: It will make the job faster and easier if you arrange the cassettes by size, with the largest on bottom and the smallest on top.)

2. Wash and dry hands. The emulsion of the film is very sensitive once it has been exposed. If the hands are not clean and dry, oil from the fingertips may leave artifacts on the finished radiograph.

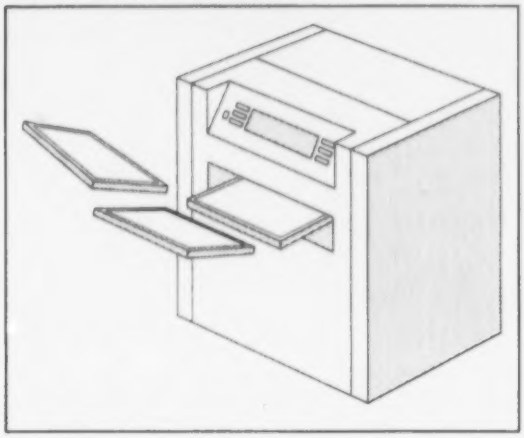
3. Turn safelights on and all other lights off. Make sure door is securely closed.

4. Retrieve each film from its cassette. Carefully place it on the processor feed tray. All films, except the 8 x 10 inch size, should be placed on the feed tray with the long edge entering first. Never put a film onto the feed tray haphazardly. After placing the first film into the processor, wait until it is ready to accept the next one. The processor will indicate when it is ready with either an audible "ding" or a safelight over the feed tray. Some machines have both a bell and a light.

5. Retrieve the films from the output tray.

In some facilities the aide will use a **multiloader,** a machine that attaches to the feed tray portion of the processor. (See Figure 2.3.) It is almost equal in size to the processor. This machine will take a cassette, open it up, remove the film, feed it to the processor, reload the cassette, close it and return it ready to use. All the operator has to do is slide the cassette into the machine through the slot at the front,

Figure 2.3 - Multiloader



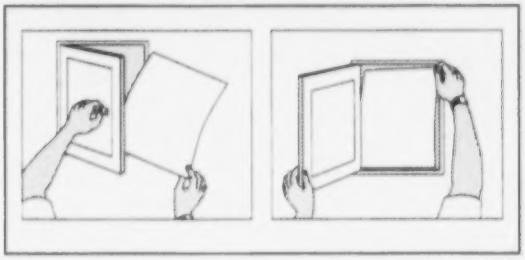
with the latch up and the open side entering first. The multiloader is completely self-contained.

As films are placed on the processor, the entry rollers detect them and activate the replenishing pumps, which add new chemicals to the tanks to replace what is being used in processing. The signal from the entry rollers to pumps ensures an adequate supply of active chemicals in the processor. The amount of new solution added is dependent upon the length of time it takes for the film to pass through the entry rollers. Since it takes longer for 17 inches to go through the rollers than 14 inches, the replenishing pumps will run longer, and more solution will be added. If too much or too little solution is added, it will adversely affect the **density** or blackness of the film.

Reloading and Cleaning Cassettes

If you are not using a multiloader, after all the cassettes are empty and the films are in the processor, reload the cassettes. Figure 2.4 shows how to load a cassette. Open the film bin and select the film size noted for the cassette. Take one film out

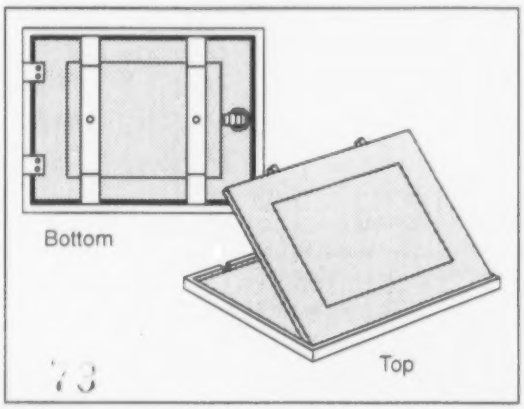
Figure 2.4 - Loading a Cassette



and place it into the open cassette. The film will fit into the bottom of the cassette like a piece of a jigsaw puzzle. If it does not, check that the film is the proper size for the cassette and that the cassette is not upside down. (See Figure 2.5.) Once the film is in place, close the top of the cassette over the bottom. If the bottom is pulled up into the top, the film will slide down or out of the cassette. Gently, but firmly, press on the latch until you hear a "click." The cassette is now properly loaded and closed.

When all cassettes are loaded and closed, put them on the side of the pass box labeled "unexposed." Make sure the processor is finished, and all the film has been removed. *Be sure the film bin is closed before leaving the darkroom.* If the film bin is open when the door to the outside is opened, all the film inside the bin will be exposed. Radiographic film is

Figure 2.5 - Film Cassette



expensive, and ruining film by leaving the film bin open is a costly error.

The radiology aide may be expected to clean cassettes and intensifying screens. Radiology department schedules vary, but empty cassettes will probably be cleaned once a day. Cassettes are designed to hold intensifying screens and film. The outsides of the cassettes may be cleaned with a regular cleaning solution. The smooth white lining inside each cassette is the intensifying screen. (The purpose of screens will be discussed in unit IV.) Intensifying screens are very delicate and expensive, and the utmost care must be exercised when handling them. Use only screen-cleaning solution and a lint-free cloth on them. Wipe them very carefully. If not treated gently, screens may lose their shape or become warped. If this happens, the screens will not contact the film properly, and blurry radiographs will result. Warped screens cannot be fixed, they must be replaced.

Film Identification

Just as it is essential that radiographs be properly flashed with patient identification, it is important that films be matched correctly with their requisitions and jackets. Use two items of patient identification, usually the name and birthdate, on the film to find the requisition and film jacket. Be aware that there may be two patients with the same name. Always use the second source of identification. Improper filing of film could lead to incorrect diagnoses, and in extreme cases, inappropriate treatment.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheet, you may take the written unit evaluation. A score of 80% indicates you have mastered this material and may proceed to the next unit.

Lesson 2: Processing Radiographs

Activity Sheet

1. List the five pieces of information that must be flashed on a radiograph.

   a.

   b.

   c.

   d.

   e.

2. List two devices that are used to flash radiographs.

   a.

   b.

3. Why is it important that your hands be clean and dry when handling films in the darkroom?

4. How should the you remove film from a cassette?

5. List two ways the processor might indicate it is ready for more film.

   a.

   b.

6. What machine automatically unloads cassettes, runs films, and reloads the cassettes?

7. Why is it important to use more than one piece of information when matching films, requisitions, and film jackets?

8. What do you use to clean intensifying screens?

9. What do you use to clean the outside of cassettes?

Clinical/Laboratory Activities

1. Make up "dummy" requisitions, film jackets, and films. Practice matching them with a classmate. Use two patients with the same name and exam but with different birth dates.

2. Draw a diagram of the darkroom in the hospital or clinic where you work. Identify the location of the processors, pass boxes, film bins, and darkroom door.

3. Ask permission to waste a film. In the darkroom at your hospital or clinic, take a piece of film out of the film bin, lay it on the counter and grab it in the middle. Then process the film and look for claw mark artifacts.

4. Use exposed film from the reject bin. Practice loading and unloading cassettes in the darkroom.

5. With your supervisor's permission, flash a patient's radiograph.

6. With your supervisor's permission and supervision, clean a cassette and intensifying screen.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet: Preparing the Darkroom Rating _____

Comments: _____

_____

Skill Sheet: Prepare the Processor for Operation Rating _____

Skill Sheet: Maintain Darkroom Integrity Rating _____

Activity Sheet: Processing Radiographs Rating _____

Comments: _____

_____

Skill Sheet: Flash with Identification Printer Rating _____

Skill Sheet: Flash with Identification Camera Rating _____

Written Unit Evaluation Score _____

Additional Comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit III

Basic Patient Care

The radiology aide must interact with patients in a courteous, caring, and safe manner. Many radiology patients, particularly outpatients, need little more than a cheerful greeting and some help in getting ready for their exams.

Inpatients, on the other hand, may be unable to move without assistance and may have difficulty talking. They are also frequently burdened with medical equipment that is necessary for their survival and recovery.

This unit will present basic information on providing for the safety of both patients and staff, moving patients about the radiology department and the hospital, and providing assistance to patients with special needs. It will also cover special equipment patients may bring with them to radiology and how the aide should respond in emergency situations.

Unit Lessons

Safety

Assisting Patients with IVs

Transferring and Transporting Patients

Assisting with Elimination

Assisting in an Emergency

Lesson 1: Safety

Objectives:

A. Identify potential hazards in the radiographic room.

B. Identify practices that prevent the spread of infection.

C. Identify when hands should be washed.

D. Select appropriate personal protective equipment.

E. Identify rules of good body mechanics.

F. Identify special precautions to follow when caring for geriatric patients.

Key Terms:

- Communicable diseases
- Body Substance Precautions (BSP)
- Personal protective equipment (PPE)
- Body mechanics

When assisting in the radiographic room, the radiology aide must be aware of potential hazards. In addition to those hazards found throughout the health care facility, additional safety concerns are created by the special design and purpose of the radiology department. The aide should be particularly alert when assisting patients in the radiographic room and when transferring them for exams.

Potential Hazards in the Radiographic Room

Exposure to Radiation

Radiation exposure is the most obvious safety hazard in the radiographic room. Practicing radiation safety at all times will minimize this hazard to patients and staff. The careful radiology aide can work within the department without fear of excessive exposure to x-radiation.

A basic rule of radiation safety is to remember to stay as far as possible from the radiation source. Stay in the control booth during exposures whenever possible. When remaining in the room, wear a lead apron. It is sometimes necessary to hold a patient to obtain a diagnostic radiograph. This should only be done as a last resort, and no one person should consistently hold patients. This duty should be shared by all members of the radiology staff.

Electrical Shock

X-ray equipment requires high voltages. Therefore, the radiographic room contains powerful transformers and generators. Electrical cables hang from the x-ray tube assembly and run under or along the floor in protective metal conduits. The radiology aide should always be aware of a patient's movements (especially a child's) to ensure that he or she never touches wires within his or her grasp or trips over wires and cables on the floor. Visually inspect wires and cables daily for breaks, kinks, and frayed areas, and report any such spots to the supervisor.

Spills

Wipe spills up immediately following departmental procedure for the type of spill. Most hospital and clinic floors, including radiology room floors, are hard

and smooth for easier cleaning and disinfection. When something is spilled on the floor, it becomes dangerously slick. To avoid spills as much as possible, staff should not eat or drink in the radiology rooms. Most facilities have staff lounges or break rooms.

Chemical Exposure

Chemicals in the various products used throughout the department are potentially hazardous if not properly used. Automatic film processor chemicals, intensifying screen cleaner, and cleaning agents used in sanitizing sprays are a few of the products that must always be used according to the manufacturers' instructions. The aide should use only prescribed solution strengths; wear all recommended personal protective equipment, such as disposable gloves, aprons, and goggles; and read the MSDS that accompanies the product.

Exposure to Infection

The radiology staff comes into daily contact with patients who have a wide variety of ailments, which creates a real hazard of spreading infection. Body substance precautions should be used at all times for the welfare of patients and staff, and personal protective equipment should be worn when appropriate. Each radiology department's procedure manual will outline standard policies. The radiology aide and other staff members must protect themselves and others from the possibility of infection presented by needle stick injuries, exposure to patients with serious diseases or illnesses, and trauma victims with open wounds or bleeding.

Most of the radiology aide's time is spent in contact with patients. The aide must be aware of the hazards and his or her role in protecting patients and staff. Many patients have **communicable diseases,** diseases that can be spread from person to person. The aide should know the practices that prevent infection from spreading.

Preventing the Spread of Infection

When working with or transporting a patient, be aware of the possibility that the patient may either have or be susceptible to an infection. Using good handwashing techniques, following body substance precautions, and using personal protective equipment will protect both staff and patients from communicable diseases.

When transporting a patient, always stop at the nurse's station before going to the patient's room. This is to alert the nursing staff that you are taking a patient to the radiology department for testing and to find out if any special precautions should be taken when handling the patient. Be aware of isolation signs on the door to his or her room. These signs will alert you to specific precautions that must be taken to protect you and the patient. If the patient is placed under respiratory isolation, for example, he or she has a disease that may be spread by droplets that are coughed, sneezed, or breathed into the air. Precautions will have to be taken to protect uninfected patients, staff, and visitors from being infected and to protect the patient from further infection. Even when no special warnings are posted, some basic precautions must be followed to protect all patients.

Handwashing

The first line of defense against the spread of germs is good handwashing. Basic guidelines for when to wash hands are as follows:

- Before and after contact with a patient,
- Before and after using the toilet,
- After assisting a patient with toileting,
- Before and after eating and smoking,
- Before donning and after removing gloves, and
- Whenever hands are soiled with body substances.

Body Substance Precautions (BSP) should be followed by all health care workers at all times regardless of the patient's diagnosis. They provide a consistent approach to managing body substances from all clients and are essential to preventing transmission of potentially infectious agents. BSP regards all blood and body fluids as potentially contagious. BSP is covered thoroughly in the *Health Care Assistant Core* and should be reviewed.

Personal Protective Equipment

Personal protective equipment (PPE) provides the second line of defense against infection. The most common of these are gloves, masks, gowns or aprons, and protective eyewear. Ordinarily, when lifting, moving, or assisting patients, only your hands will come into contact with the patient and any infectious agents that may be present. Gloves provide a simple and effective shield.

For example, if a patient who is incontinent is to be moved, gloves should be worn when reaching under him or her to grab a transfer sheet. If there is a possibility that fluids may be splashed, additional equipment should be worn. If, for instance, you are required to transport a patient who is bleeding, wear a gown and goggles in addition to gloves.

Gloves must be changed in between patients and when they are torn or punctured. Radiology aides should become familiar with both departmental and hospital policy on infection control and the use of protective equipment.

Rules of Good Body Mechanics

Another risk to the safety of health care workers is injury from improperly lifting or positioning patients. Back strains and sprains are the most common type of injury. Radiology aides must often lift patients or help them to move from stretchers and wheelchairs into beds or onto radiographic tables. These types of transfers will be discussed in lesson 3. Transfers, if not performed properly, can result in back strain. Injuries can be avoided by using proper **body mechanics**, which is the effective use of the body to move objects or people without causing injury. The following are the ten basic rules of body mechanics techniques for lifting and moving patients and objects in a manner that does not add undue strain on the body.

1. Before lifting a patient, make sure the patient knows he or she is going to be lifted. Describe what is going to happen.

2. Evaluate the size of the load before lifting. Do not attempt to lift a patient or object by yourself unless you are certain that you can handle it alone. Get a partner if necessary.

3. Check your footing. Spread your feet shoulder-width apart to give you a wider base of support and better balance.

4. Get close to the object or patient to be lifted. Do not reach! Move in and hold the patient or object close.

5. Line your body up straight. Maintain the normal curve of your back and bend at the hip and knees, NOT at the waist.

6. Straighten your legs to lift. Let the stronger muscles of your legs do the work.

7. Lift the object or patient smoothly, avoiding jerky movements. While lifting with a partner, count to three, lifting together on the count of three.

8. If you need to turn while holding the object or patient, do so by turning your feet. Never twist your body.

9. Push or pull an object instead of lifting it whenever possible; it is safer and easier.

10. Share these rules with others, so that everyone will lift safely and well.

Caring for Geriatric Patients

Another area of special concern is the handling of geriatric patients. As we advance in age, our bodies go through many changes. Those involving bones, muscles, and skin are of primary concern. Bones and muscles atrophy, which means they become weaker because they are used less. Bones are less able to support weight, and muscles may be incapable of flexing or extending fully. Because their bones are weaker and more brittle, geriatric patients must be treated gently. Support a geriatric patient's joints when moving him or her. When helping a geriatric patient sit or lie down on a hard radiographic table, make sure that he or she is placed gently to reduce the impact on the bones. The skin of geriatric patients often becomes thin, like tissue paper. It tears quite easily and is more susceptible to abrasions. Whenever possible, avoid sliding the geriatric patient. Use a transfer sheet instead. Make sure the geriatric patient's skin is protected from abrasions.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Safety

Activity Sheet

1. List three potential radiographic room hazards.

   a.

   b.

   c.

2. List two practices that prevent the spread of infection.

   a.

   b.

3. List four instances in which an aide should wash his or her hands.

   a.

   b.

   c.

   d.

4. Which patients and which body substances are included in BSP?

5. List the four most common pieces of personal protective equipment.

   a.

   b.

   c.

   d.

6. List five rules of good body mechanics.

   a.

   b.

   c.

   d.

   e.

7. List three precautions to take when handling geriatric patients.

   a.

   b.

   c.

Clinical/Laboratory Activities

1. Observe the activities in your clinical setting. Watch how the staff and patients move. Identify and write down situations in which good body mechanics were demonstrated. Discuss your findings with your classmates, clinical site supervisor, and classroom instructor.

2. Sometimes it is difficult to perform activities with good body mechanics. Think of several circumstances under which this might occur. Write a description of at least three situations with possible solutions. Discuss the situations with your classmates.

3. If there is time available, ask you clinical supervisor to point out the various potential hazards in the radiographic room. For example, examine the wiring for the x-ray machine and the cables or conduit on or under the floor of the room.

4. Locate the supply of personal protective equipment at your clinical site. Are there sufficient supplies on hand? Is all the basic equipment there? Where are the contaminated waste containers? Write a summary of your findings. Compare your findings with those of your classmates, and discuss them with your classroom instructor.

Lesson 2:
Assisting Patients with IVs

Objectives:

A. Identify components of IVs.

B. Identify reasons for nonfunctioning IVs.

C. Identify signs of infiltrated IVs.

D. Place gown on and remove gown from patient receiving IV therapy.

Key Terms:

- Catheter
- IV bag
- Tubing
- Drip chamber
- Flow control
- IV pump
- Occlusion
- Infiltration

The radiology aide will frequently have to cope with patients with intravenous (IV) lines and should have a basic understanding of how they are made and what they do. An IV is an effective means of delivering fluids to a patient. A small needle or hollow tube called a **catheter** is placed into a vein. The catheter is usually placed in the forearm or hand. The catheter is then connected to a bag filled with the liquid to be infused into the patient's bloodstream.

Components of IVs

An intravenous system has five major components:

1. The **IV bag** or bottle is a plastic bag or (less commonly) a glass bottle filled with fluid.

2. **Tubing** connects the bag with the catheter in the patient's vein.

3. The first portion of the tubing that connects directly with the bag is called the **drip chamber**. The drip chamber is a widened section of tubing filled approximately half full of IV fluid. The hole in the top of the chamber allows the fluid to drip into the chamber.

4. The rate of flow is controlled by the **flow control**, most commonly a piece of plastic that the tube runs through. There is a round plastic thumb roller above the tubing that is used to adjust the pressure and control the flow. The nurse or doctor will adjust the flow.

5. The final portion is the catheter, which is the part of the IV system actually within the patient's vein.

Sometimes the IV is connected to an **IV pump,** which is an electrical device that automatically controls the rate of flow of the IV fluid into the patient. Generally, an IV pump is plugged into an electrical outlet and has a rechargeable battery backup. These systems may be unplugged from the wall, and the battery will provide sufficient power to keep the pump running for some time.

Reasons for Nonfunctioning IVs

IV pumps are equipped with alarms that will sound for a number of reasons. For example, when the backup battery is in use and begins to weaken, a high-pitched electronic beep will sound. If this occurs, the alarm will usually be silenced as soon as the pump is plugged back into the wall.

The pump alarm will also sound due to an **occlusion**, a blockage in the catheter or tubing. Sometimes the blockage is simply a matter of the tubing becoming kinked. If the alarm sounds and the occlusion warning light is on, check the line for kinks. If no kinks are present, then the problem lies elsewhere. Report the occlusion to a supervisor or a nurse as soon as possible.

Do not attempt to silence any IV pump alarm by pressing buttons or attempting to reset the machine. These operations should only be performed by a qualified nurse, a doctor, or a specially trained staff member.

Some common problems arise with IVs as patients are transported. The radiology aide should be aware of these problems and the immediate steps to take to fix them. If a problem cannot be solved quickly, the aide should call for help. If blood backs up into the tubing close to the needle, it means that the pressure inside the vein is greater than the pressure of the column of IV fluid. In other words, the blood is forcing its way up the needle and into the tube. Make sure that the IV bag is higher than the needle. Have the patient put his or her arm down and raise the bag above the patient's head. Make sure fluid is dripping into the drip chamber. If the IV is still dripping, the blood should clear from the tube within a few minutes. If it does not clear, call for assistance. (See Figure 2.1 for a list of dos and don'ts.)

Figure 2.1 - Dos and Don'ts with IVs

Do	Don't
Use caution when working with the patient's arm with an IV in it.	Allow the tubing to drag on the floor.
Keep the IV bag above the level of the heart.	Allow the patient to lie on the tubing.
Maintain the arm in anatomical position to avoid clamping off the catheter.	Kink the tubing.
	Pull on the IV tubing.

Infiltrated IVs

Another common problem with an IV is **infiltration**. When an IV becomes infiltrated, it means that the needle, or catheter, has broken through the blood vessel wall, causing the IV fluid and blood to leak out of the vein into the surrounding tissue. When this occurs, the patient will complain of pain around the insertion point of the catheter. The drip chamber will most likely not indicate any problem with the flow. Examine the area around the needle. When an IV has infiltrated, the skin around the area will appear swollen. A bruise may also be present. Ask a supervisor to check for infiltration.

Gowning IV Therapy Patients

Many of the patients who are to be transported to radiology will be on IV

therapy. This presents a special challenge if the radiology aide must help them change into gowns for their exams. If a patient normally wears pajamas, he or she must be assisted into a hospital gown so that the metal buttons or snaps of the pajamas will not show up on the radiograph. It is not especially difficult to put a gown on a patient with an IV, but it does take patience and care. Use the following steps: *(If the patient has an IV pump, do not attempt to change the gown!)*

1. Make certain there is plenty of slack in the IV tubing.

2. Instruct the patient to slide the arm with the IV out of the sleeve, being careful that the needle does not get caught on the material. Always try to maintain the modesty of the patient. Have a sheet ready to cover the patient as he or she is disrobing.

3. When the arm is free of the sleeve, slide the IV bag up the sleeve and out of the shirt.

4. Pull the remainder of the tubing through the sleeve.

5. Once the side of the garment with the IV is off, have the patient slip out of the other side as he or she would normally remove the garment.

6. Take the IV bag and slide it through the sleeve of the gown from the inside to the outside.

7. Pull the tubing through the sleeve.

8. Have the patient place the arm with the IV needle through the opening, being careful not to catch the needle on the sleeve.

9. Once the arm with the IV is through, have the patient put the free arm through the other sleeve.

10. Tie the gown for the patient.

Some gowns are made specifically for patients on IV therapy. Snaps open from the neck down the shoulder. To change the gown, snaps are opened and the gown slid off without affecting the IV. If the snaps are made of metal, however, they may interfere with the taking of radiographs. Many gowns now are made with plastic snaps. If a patient is wearing a gown with metal snaps, check with the radiographer who will be doing the exam to see if the gown should be changed for one without snaps. It may be possible for the radiographer to move the snaps out of the way.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 2: Assisting Patients with IVs

Activity Sheet

1. List the five major components of an IV system.

   a.

   b.

   c.

   d.

   e.

2. List two common reasons for an IV pump alarm to sound.

   a.

   b.

3. List two signs of an infiltrated IV.

   a.

   b.

4. What may cause blood to flow up into the IV tubing?

5. Why must patients wear gowns without snaps, rather than pajamas, when radiographic exams are to be performed?

6. When should you not help a patient on IV therapy change into a gown?

Clinical/Laboratory Activities

1. With the help of a classmate, alternate role-playing a radiology aide and a patient. Tape a piece of rubber tubing to the arm of the "patient" who is sitting in a wheelchair. Place the bag on an IV pole. The "patient" should be wearing a pajama top. The "aide" must remove the pajama top from the "patient" without letting the bag end of the tube drop below the "patient's" shoulder, and then put a hospital gown on the "patient." Write down any significant problems you and your partner encountered. Review your experience with your classroom instructor.

2. Ask your clinical supervisor to demonstrate how to put a gown on a patient who has an IV. With your supervisor's permission and supervision, assist a patient with gowning.

Lesson 3: Transferring and Transporting Patients

Objectives:

A. Identify situations in which patients require assistance.

B. Supervise an independent transfer.

C. Transfer patient from bed to wheelchair.

1. Stand and pivot: active-assisted
2. Stand and pivot: passive-assisted
3. Swing
4. Sliding board

D. Transfer a patient from a stretcher to the radiographic table.

E. Transfer a patient from a wheelchair to the radiographic table.

F. Transport patient via wheelchair.

G. Transport patient via stretcher.

H. Transport patient on oxygen therapy.

Key Terms:

- Transferring
- Transporting
- Independent transfer
- Dependent transfer
- Active-assisted transfer
- Passive-assisted transfer
- Gait belt
- Transfer sheet
- Ambulatory

Many of the patients in the radiology department will require some form of assistance to move about. The amount of assistance can range from giving the patient minimal support to physically moving the patient from one place to another. A distinction must be made between transferring and transporting. **Transferring** refers to moving a patient from one surface to another, such as from a bed to a wheelchair. **Transporting** refers to moving a patient from one area to another, such as from the patient's room to the radiology department.

Situations in Which Patients Require Assistance

For the most part, patients wish to do as much for themselves as possible. Most people do not like feeling helpless; however, a patient who has recently undergone surgery, or whose medical condition causes him or her to be weak or disoriented, may require help. Patients may also be in pain or on medication and overestimate what they are able to do alone. Always ask the nurse assigned to the patient how much assistance is needed. Also, ask each patient how he or she feels that day. Even normally independent patients may need extra assistance.

Supervising an Independent Transfer

An **independent transfer** is one in which the patient is capable of standing and moving on his or her own. Patients who have adequate strength and balance will be able to transfer independently. Patients who are allowed and encouraged to do as much for themselves as possible will recover more quickly. Even patients who can move independently may become easily fatigued. Those patients should transfer from bed to wheelchair.

The basic steps for supervising an independent transfer are listed below. Always be prepared to step in and offer assistance to patients transferring independently.

- Patients should always have on shoes with nonskid soles before beginning a transfer.

- Position the wheelchair for the patient. Place the wheelchair so that the wheels are almost parallel to the bed, with the front of the chair at a slight angle toward the patient's preferred or strong side. Lock the wheels and raise the footplates of the wheelchair.

- A patient who is strong enough to transfer independently will usually prefer both armrests left on the wheelchair to grasp with both hands for additional support. This allows the patient to sit down slowly and carefully without the aide's assistance.

- The well-oriented patient who can transfer independently will usually not require a wheelchair safety belt, but it is generally advisable to have the patient fasten the belt if the wheelchair has one.

Transferring from Bed to Wheelchair

Patients who need assistance require a **dependent transfer**. If the patient is able to help, it is an **active-assisted transfer**. If the patient is completely dependent, it is a **passive-assisted transfer**. There are three types of one-person sitting transfers: the *stand and pivot,* the *swing,* and the *sliding board.*

For all dependent transfers, use a **gait belt,** a thick belt placed around the patient's waist and used by the aide to assist the patient in moving, transferring, and ambulating. A gait belt is also called a transfer belt.

Stand and Pivot Transfer

The stand and pivot transfer requires varying amounts of assistance, from minimal to considerable assistance. If there is any question of whether the transfer can be accomplished by one person, the aide should ask for assistance. The position of the wheelchair relative to the bed or table can vary depending upon whether one or two persons are assisting. The 45-degree angle provides space for the second helper. During the transfer, instruct the patient about each step in the procedure so that you can coordinate your efforts and the patient can learn to transfer more independently in the future.

An independent patient can use a wheelchair with fixed arms that cannot be removed. However, a dependent patient should have a wheelchair with removable armrests. Before the transfer, remove the armrest nearest the patient. The opposite armrest should be left in place for safety and so the patient can grasp it for additional support as much as possible. If the near armrest is not removed, the dependent patient might be bruised or might fall while attempting to get up and over the armrest. If a dependent patient must be transferred into a wheelchair that does not have a removable armrest, at least two helpers will be required.

You must use good body mechanics during the transfer. *Do not let the patient hold on to your neck or arms.* Rather, the patient should use his or her hands to push off from the surface and reach for the chair arm before sitting down. The only time a patient may have his or her arms on the *shoulders* of the caregiver is when the patient is very weak or paralyzed.

Steps of Procedure for Stand and Pivot Transfer (Active-Assisted):

1. Wash your hands.
2. Assemble necessary equipment.
3. Identify and greet patient. Identify self.
4. Explain what you are going to do.
5. Provide privacy.
6. If at bedside, adjust bed height to low position. Lock brakes of bed.
7. Assist patient to move to within five or six inches of the edge of the bed/table.
8. Assist in putting on socks and nonskid shoes.
9. Position wheelchair on patient's strong side if indicated; if not, position wheelchair as desired.
10. Place wheelchair parallel to or at a 45° angle to the bed/table.
11. Lock the wheels of the wheelchair.
12. Cover wheelchair with bath blanket and/or protective pad. Raise footplates and remove if possible. Remove the armrest on the side next to the bed/table
13. Assist the patient to sit up.
    a. Prepare to follow principles of good body mechanics for lifting.
    b. Put one forearm under patient's shoulders and the other behind the knees.
    c. Bend your knees, keep your back straight, and stand with feet about 18 inches apart.
    d. Straighten your hips and knees while shifting weight from front foot to back foot. At the same time, lift patient's head-neck with one arm while pulling the legs over the side of bed with other arm.
14. Apply gait belt.
15. Allow the patient time to adjust to being in a sitting position before you proceed. Assist the patient in maintaining a sitting position as needed.
16. Place hands underneath belt along the patient's side with palms up.
17. Instruct patient to stand on the count of three.
18. Assist patient to stand and support the weak leg with your knee, if indicated.
19. Instruct patient to reach with his or her strong hand and grasp for the far armrest of the chair.
20. Assist the patient to pivot toward his or her strong leg by turning your own body. Do not twist; turn your body as a unit.
21. Gently assist patient to sit by bending your knees while keeping back straight.
22. Replace wheelchair parts and make sure they are secure.
23. Help patient move back in wheelchair, straighten the seat cushion and patient's clothing, and fasten seat belt.

24. Position the weak arm and leg properly on the armrest and footplate. A pillow may be used to support the weak arm.

25. Wash your hands.

Steps of Procedure for Stand and Pivot Transfer (Passive-Assisted):

1. Wash your hands.

2. Assemble necessary equipment.

3. Identify and greet patient. Identify self.

4. Explain what you are going to do.

5. Provide privacy.

6. If at bedside, adjust bed height to low position. Lock brakes of bed.

7. Assist patient to move to within five or six inches of the edge of the bed/table.

8. Assist in putting on socks and nonskid shoes.

9. Position wheelchair on patient's strong side if indicated; if not, position wheelchair as desired.

10. Place wheelchair parallel to or at a 45° angle to the bed/table.

11. Lock the wheels of the wheelchair.

12. Cover wheelchair with bath blanket and/or protective pad. Raise footplates and remove if possible. Remove the armrest on the side next to the bed/table.

13. Assist the patient to sit up.

    a. Prepare to follow principles of good body mechanics for lifting.

    b. Put one forearm under patient's shoulders and the other behind the knees.

    c. Bend your knees, keep your back straight, and stand with feet about 18 inches apart.

    d. Straighten your hips and knees while shifting weight from front foot to back foot. At the same time, lift patient's head-neck with one arm while pulling the legs over the side of bed with other arm.

14. Apply gait belt.

15. Allow the patient time to adjust to being in a sitting position before you proceed. Assist the patient in maintaining a sitting position as needed.

16. Stand directly in front of the patient, grasp the back of the belt.

17. Support the patient's knees and feet with your knees and feet, either knee-to-knee or your knees on the sides of the patient's knees, whichever is comfortable for you and the patient.

18. Have the patient lean forward while sitting on the edge of the bed/table.

19. On the count of three, have the patient push up as much as possible while you pull him or her up by straightening your legs and hips and holding onto the belt.

20. Pivot your entire body as well as the patient's body.

21. Lower the patient into the wheelchair by bending at your knees and hips as the patient sits down.

22. Replace wheelchair parts and make sure they are secure.

23. Help patient move back in wheelchair, straighten the seat cushion and the patient's clothing, and fasten the seat belt.

24. Adjust footplate for patient; cover with a lap robe.

25. Position pillow(s) to provide proper body alignment and joint support.

26. Wash your hands.

The process is reversed to transfer the patient back out of the wheelchair, except that the patient pushes up on the arm of the wheelchair instead of the bed. Remember to remove the near armrest of the wheelchair.

Swing Transfer

A dependent swing transfer is similar to an active-assisted stand and pivot transfer except that it is accomplished much more quickly and the patient does not stand up completely. Instead, momentum of the swing is used to move the patient from place to place. A wheelchair with a removable armrest must be used.

Steps of Procedure for Swing Transfer:

1. Wash your hands.

2. Assemble necessary equipment.

3. Identify and greet patient. Identify self.

4. Explain to the patient that you are about to assist with the transfer.

5. Provide privacy.

6. Position the wheelchair to the patient's strongest/preferred side.

7. Lock the wheels on the wheelchair.

8. Raise and, if possible, remove footplates and the armrest nearest the patient; put them out of the way.

9. Help the patient sit up and slide forward. (While the patient's feet may be on the floor, little or no weight will be borne on them.)

10. Apply a transfer belt.

11. If possible, let the patient grasp the remaining armrest with one hand; the other hand should be ready to push down on the surface to help raise the body.

12. Grasp the patient's knees between your knees.

13. Hold the transfer belt with both of your hands at the patient's sides.

14. Ask the patient to bend forward and lower his or her head away from the seat of the wheelchair. Explain to the patient that you will count to three. Have the patient rock forward with each count and prepare to transfer on "three."

15. On the command, using good body mechanics, lift the patient enough to clear the surfaces, directing his or her buttocks toward the seat of the wheelchair.

16. Help the patient move back in the wheelchair, straighten the seat

cushion and patient's clothing, and fasten the seat belt.

17. Replace wheelchair parts and make sure they are secure.

18. Wash your hands.

The process is reversed to transfer the patient back out of the wheelchair, except that the patient reaches for the edge of the bed or table instead of the wheelchair armrest.

Sliding Board Transfer

A sliding board transfer is used for a dependent patient who is unable to stand at all, or is too weak or heavy to do a swing transfer. Because the patient who must have a sliding board to transfer tends to be very weak or have poor balance, you will have to be particularly careful not to allow him or her to fall from the sitting position. Be sure the patient has on clothing that will allow his or her hips to slide on the sliding board. Use powder on the board or place a towel or pillowcase under the patient to reduce the chance of friction burns during the transfer.

Steps of Procedure for Sliding Board Transfer:

1. Wash your hands.
2. Assemble necessary equipment.
3. Identify and greet patient. Identify self.
4. Explain the procedure to the patient.
5. Provide privacy.
6. Position the wheelchair at an angle next to bed or mat.
7. Lock the wheels on the wheelchair.
8. Remove both footplates and the armrest nearest the patient.
9. Help the patient sit up and put on a transfer belt.
10. Have the patient lean away from the wheelchair by rolling up on his or her hips.
11. Slide the board as far under the patient's hips as possible. Be careful not to pinch the patient's buttocks.
12. Place the other end of the board on the wheelchair cushion, bridging just in front of the wheel of the wheelchair.
13. Have the patient reach for the armrest with the leading hand and try to push his or her body up and toward the wheelchair with the trailing hand.

    Note: The patient with very weak arms may place his or her arms on your shoulders, but you must never allow the patient to grasp you around your neck.

14. Steady the patient's knees between your knees.
15. Grasp the transfer belt with your hands and help the patient slide over to the wheelchair. The sliding process can be either slow or fast, much like the swing transfer. If necessary, this movement may be accomplished by several lift and slide motions.
16. Remove the sliding board.
17. Straighten the seat cushion and the patient's clothes, and fasten the wheelchair safety belt.
18. Replace the armrest and footplates and be sure they are secure.

19. Wash your hands.

Transferring from a Stretcher to the Radiographic Table

Remember that most patients come to the radiology department for diagnosis of an injury or illness. Patients may be unaware of the severity of their condition and attempt to do more than they should. Patient safety is the main concern when transferring.

The transfer precautions taken in the radiographic room are basically the same as those taken in other areas with modifications for radiographic room design and equipment. Move patients gently to avoid abrasions, skin tears, and punctures. Keep all unnecessary radiographic equipment out of the way. Be aware of wires and cables on the floor.

Critically ill or injured patients undergoing radiographic exams must be continually monitored by nurses, respiratory therapists, physicians, radiographers, or other staff members. They should never be left alone. Lines, tubes, and bags from IV and oxygen therapy are a special concern. They can become tangled around the patient or around x-ray equipment. For example, kinked or compressed IV tubing will obstruct the flow of IV solution to the patient's bloodstream. Handle all lines, tubes, and bags carefully so that their function is not disturbed.

Never remove a patient's safety device to get a better projection without permission from the radiographer or attending physician. If a patient arrives at the radiology department on a backboard, do not adjust or remove it without specific instructions. Immobilization devices, such as neck collars, splints, sandbags, and sponges are used to prevent further injury to the patient and should remain in place until a physician orders them removed.

During transfer from a stretcher or slide board to the radiographic table, the patient's head, neck, and spine must not move. One staff member should support the head and neck while other staff members move the torso, pelvis, and legs. This type of transfer is accomplished in one motion and requires the complete cooperation of the staff. To allow the staff to move as a single unit, a signal is given to begin the transfer. Often a count of three is used, with the transfer to begin on three.

Moving the patient from stretcher to radiographic table may be done by sliding the patient on a transfer sheet from one surface to another. More than one person is needed. The surfaces must be at almost the same height. The patient should be lying on a regular bed sheet or blanket. A second sheet, called a **transfer sheet**, or lift sheet, is often placed under the patient's body to help change the patient's position on the bed sheet. This transfer sheet is used to transfer the patient from one surface to another surface.

Before beginning a transfer, be sure that the radiographic table has been prepared:

- If the radiographic table has a floating top, adjust the level so that it is even with the stretcher mattress.
- If the radiographic table footboard is to be used, fasten it securely to the table end and check it for stability.

Steps of Procedure for Sliding Transfer

1. Wash your hands.
2. Assemble necessary equipment.

3. Identify and greet patient. Identify self.

4. Explain the procedure to the patient.

5. Provide privacy.

6. Lock or block wheels of all equipment.

7. Line up the stretcher parallel to the radiographic table.

8. Fold or place patient's arms close to the body.

9. Be certain the patient's head or feet will not hit any obstacles during the transfer.

10. Two caregivers stand next to the x-ray table and reach across it to grasp the sheet that is under the patient. They may place one of their knees on the table for better body mechanics.

11. A third caregiver stands on the far side of the stretcher and grasps the sheet.

12. On the count of three with a command, the caregivers smoothly slide (lifting slightly to minimize friction) the patient from the stretcher to the radiographic table.

13. Wash your hands.

Transferring from a Wheelchair to the Radiographic Table

An experienced aide may work alone in getting a patient from a wheelchair onto onto the radiographic table. Before attempting to transfer a patient, find out how much the patient can do without help. Be sure there are enough staff members present to safely move the patient if he or she requires assistance.

The radiology aide should be very cautious in assisting with wheelchair transfers. Often the radiology room is the second stop after an orthopedic exam or the emergency room. The patient's injury may be undiagnosed at this point, and further injury could occur from mishandling. Follow the steps of procedure listed below:

1. Place the wheelchair parallel to and as close as possible to the radiographic table.

2. Lock the wheels of the wheelchair.

3. Explain to the patient that he or she needs to get out of the wheelchair and onto the radiographic table. Assure the patient that all the help he or she needs will be provided.

4. Stand directly in front of the patient or on the patient's weaker side.

5. Help the patient stand.

6. Allow the patient time to get his or her bearings.

7. If the footstool is used, ask the patient to step onto the stool with his or her best leg. As the patient steps up, he or she should bring the other foot up to the stool.

8. Have the patient turn so that his or her back is to the radiographic table.

9. Have the patient sit down on the side of the table with his or her legs over the edge.

10. Ask the patient to lie down on his or her back.

11. If the patient needs help, explain that you will be turning him or her to lie back on the table.

12. Place one arm around the patient's back and shoulders and the other arm under the patient's knees.

13. Use the arm around the patient's back and shoulders to lower the upper part of the body toward the table while using the arm under the patient's knees to lift and swing the patient's legs to the bottom of the table.

Reverse this process when returning the patient to the wheelchair from the table. Remember to instruct the patient to step down to the footstool with his or her weakest leg. If the stool has a handrail, it should be on the patient's strong side, while the staff member stands at the patient's weak side to provide support. The patient then steps to the floor with the strong leg and foot. After the patient is steady, he or she should turn so his or her back is to the wheelchair, bend at the knees, and sit down.

Transporting Patients

Whenever you are asked to transport a patient to the radiology department, you must determine the patient's ability to get out of bed and into a wheelchair or onto a stretcher. When requisitions are sent to the radiology department for procedures, the patient's mode of transport is usually listed on the form. If the patient is **ambulatory,** able to walk, this is your first indication of the patient's general condition. *Ambulation* is considered one of the modes of transport. There are two others: by wheelchair and by stretcher.

Remember that the first thing to do when transporting a patient from his or her unit to the radiology department is to stop at the nurse's station and let the nurses know that you will be taking a patient from the floor. Ask the nurse in charge of the patient if any special precautions are required, and check to see if the mode of transport is correct. Sometimes a patient's condition changes after an exam has been ordered. He or she may have been able to travel by wheelchair in the morning but requires a stretcher by the afternoon.

When you enter a patient's room, state your name and inform the patient that you are from the radiology department and are going to transport him or her for tests. Ask the patient how he or she feels. Also ask the patient if he or she has recently had surgery or has any tender or sore areas, so you do not inadvertently put pressure on these areas during transferring and transporting. Following the steps of procedure listed previously, assist the patient to transfer to the stretcher or wheelchair to be used for transporting.

Transporting via Wheelchair

There are a few basic rules to follow when transporting a patient by wheelchair.

1. Prepare to transport a patient by taking along an extra sheet or two. For a wheelchair transport, use a sheet to cover the seat and back of the chair for the comfort of the patient. The second sheet is used to cover the patient's lap.

2. When pushing a patient in a wheelchair through the hospital, do not hurry. A whirlwind trip through the hallways can cause a patient great distress.

3. Try to always move the wheelchair in the direction the patient is facing.

4. When getting on an elevator, enter it by moving forward. Once on the elevator, turn the chair around so the patient is facing the door. This may seem unnecessary, but many people become dizzy or disoriented if moved backwards.

Transporting via Stretcher

The rules for transporting by stretcher are as follows:

1. Before leaving the room with the patient on a stretcher, make sure the side rails are securely locked in place.

2. Do not push the stretcher too fast, and always move the patient's feet first. Elevate the patient's head if possible to allow the patient to see where he or she is going.
3. There is generally not enough room to turn a stretcher around in an elevator. Enter the elevator with the patient's feet first. After exiting the elevator, turn the stretcher so that the patient's feet are pointing in the direction you are going.

Transporting Patient on Oxygen Therapy

Some patients may be receiving oxygen as a part of their medical treatment. It is necessary to maintain the correct flow of oxygen at all times. Check the requisition form before transporting the patient. If he or she is receiving oxygen, it should be stated on the form. Most wheelchairs and stretchers can be equipped with portable oxygen tanks for such occasions. Before leaving the radiology department, check the tank to be sure there is an adequate supply of oxygen. Locate the indicator on the valve assembly at the top of the tank. If the oxygen level is low, inform your supervisor before proceeding. Usually the respiratory therapy department monitors tanks. When you check in at the nurse's station, ask for help with the oxygen. The nurse or the nurse's designee will transfer the patient's oxygen supply. This includes turning the oxygen on and off, disconnecting and reconnecting the oxygen tubes, and maintaining the proper oxygen flow. Make sure you have enough slack in the oxygen tubing to reach from the bed to the wheelchair, or from the bed to the stretcher, before you begin the transfer.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 3: Transferring and Transporting Patients

Activity Sheet

1. Explain the difference between transferring and transporting.

2. List two types of transfers.

   a.

   b.

3. List two devices used to help transfer patients.

   a.

   b.

4. Why must lines, tubes, and bags be closely observed during transfer?

5. Why should the aide never remove a patient's backboard?

6. What is a transfer sheet?

7. When transferring a patient from a radiographic table to a wheelchair, which side should the radiology aide stand on?

8. List the three modes of transport.

   a.

   b.

   c.

9. How does the aide know which mode of transport to use?

10. When transporting a patient on oxygen therapy, who should transfer the oxygen?

Clinical/Laboratory Activities

1. Ask your clinical supervisor to demonstrate the following transfers and transports. Under your supervisor's direction practice transfers and transports with another student or employee.

    1. Supervise an independent transfer.
    2. Transfer patient from bed to wheelchair using the stand and pivot (active-assisted).
    3. Transfer patient from bed to wheelchair using the stand and pivot (passive-assisted).
    4. Transfer patient from bed to wheelchair using the swing transfer.
    5. Transfer patient from bed to wheelchair using the sliding board transfer.
    6. Transfer patient from bed to stretcher using a sliding transfer.
    7. Transfer patient from stretcher to radiographic table using a sliding transfer.
    8. Transport patient via wheelchair.
    9. Transport patient via stretcher.
    10. Transport patient on oxygen therapy.

2. Now practice transferring "patients" with limited mobility, for example, let a "patient's" left arm and leg go completely limp, blindfold another, and put one "patient's" leg in a temporary splint. Discuss your experiences.

3. With your clinical supervisor's permission and supervision, transfer and transport patients using the techniques listed above.

Lesson 4:
Assisting with Elimination

Objectives:

A. Assist patient to and from the bathroom.

B. Give and remove a bedpan.

C. Give and remove a urinal.

D. Maintain patient's urinary catheter.

Key Terms:

- Urinary catheter

A patient may need to use the bathroom while in the radiology department. At the end of an examination of the kidneys, it is often necessary to have the patient urinate. Another radiograph is then taken, called a *post void*. This radiograph is used to evaluate how well the bladder empties and the condition of the inside of the lining of the bladder. After a barium enema, it is necessary to have the patient defecate. A radiograph is then taken and used to evaluate how well the colon functions and also to view the lining of the colon. Sometimes patients are simply unable to wait to use the bathroom until they get back to their own rooms. In any of these cases, the radiology aide may be called upon to help the patient.

Assisting Patient to and from the Bathroom

If the radiology aide is unfamiliar with the patient's ability to move, he or she should ask the technician if the patient is able to stand alone. The aide must also know if the patient's urine output volume is being measured or if the urine should be strained to check for the presence of kidney stones. If it is to be measured, the patient must be given a urinal or bedpan. After elimination, the urine must be saved, so it can be measured and/or strained when the patient is returned to his or her room.

If the urine is not to be saved, the contents of the bedpan or urinal must be flushed down a toilet. The urinal or bedpan should be rinsed. If it is a disposable item, it should be placed in the appropriate receptacle for contaminated waste. Contaminated waste receptacles are discussed in detail in unit IV, lesson 3. If it is a reusable item, it should be sealed in plastic and returned to the proper department for sterilization. Aides should always use gloves when assisting a patient with elimination. When simply assisting a patient to the bathroom, you need not wear gloves; however, if the possibility of contact with bodily waste exists, they should be worn. As was mentioned in the lesson on safety, wash hands before and after glove use. Dispose of gloves in the proper contaminated waste container.

Accompany ambulatory patients if they need support getting from the table to the bathroom or, perhaps, help with an intravenous (IV) stand. With one hand, hold the patient by the arm just below the shoulder. With the other hand pull the IV stand. Get the patient into the bathroom, make sure the toilet paper is within easy reach, and point out the call signal to the patient. Instruct the patient to use the call signal when he or she is done.

A patient in a wheelchair who can move easily may simply be wheeled to the bathroom door. After the chair's wheels are locked, the patient can get out of the chair and go into the bathroom. Be sure to point out the location of the call signal,

and make sure toilet paper is within easy reach. Instruct the patient to use the call signal when he or she is ready. If the patient has not called within five minutes, knock on the door to make sure that he or she is fine.

If a patient requires help, stay in the bathroom with him or her. If the patient is unable to wipe him- or herself, put on gloves and wipe the perineal area with disposable wipes or toilet paper. Be sure to wipe from the front of the perinal area toward the anus. When finished, the aide should dispose of the gloves, then both the aide and the patient should wash their hands.

Giving and Removing a Bedpan

Bedpans may be used for patients who cannot be easily moved to the bathroom. One situation in which a bedpan might be necessary is when a patient who is not able to move easily has an enema ordered. Getting to the bathroom is simply not possible for an immobile patient when the colon is full. In these cases a bedpan is needed. Use the following steps:

1. Wash hands.
2. Put on gloves.
3. Explain what you are going to do.
4. Provide privacy.
5. Place patient in supine position or as close to supine position as possible.
6. Patient is unable to assist
   a. Turn client on his or her side facing away from you.
   b. Expose buttocks and position bedpan firmly against buttocks.
   c. Place a small pillow or rolled towel at the top of the bedpan at the small of the patient's back.
   d. Turn patient toward you and onto bedpan.

   Patient is able to assist - If the patient is able to perform the necessary movement, this method is easier for the aide to use.

   a. Have the patient flex his or her knees and lift buttocks off table or stretcher. Make sure the patient's gown is open in the back.
   b. With your other hand, slip the bedpan under the patient's hips and adjust.
7. Place toilet tissue within reach.
8. Remove gloves and dispose of in proper container.
9. Wash hands, and leave the room. (Remain near enough to hear the patient if he or she calls out.)
10. Return to the room promptly when the patient calls or check on him or her after five minutes.

    Note: Do not leave patient on bedpan over ten minutes. It may lead to extreme discomfort and result in skin breakdown.
11. Wash hands.
12. Put on gloves.
13. Patient is able to assist–Place one hand under the small of the back and

assist patient to raise his or her hips. Hold bedpan with other hand.

Patient is unable to assist–Hold bedpan with one hand and roll patient off pan with other hand. This will prevent contents of bedpan from spilling.

14. Remove bedpan and then cover it.

15. Wipe, wash, and dry perineal area from front to back.

16. If urinary output is being measured, cover the bedpan and return it with the patient to his or her floor.

17. If urinary output is not being measured, take bedpan to bathroom and empty into toilet.

18. If bedpan is reusable, seal it in plastic and return to the appropriate department for sterilization.

19. Remove gloves and dispose of in appropriate container.

20. Wash hands.

21. Give patient a clean, wet washcloth to wash his or her hands.

22. Make patient comfortable.

Giving and Removing a Urinal

If a male patient in a wheelchair is relatively independent and needs to urinate, providing a urinal may be preferable to transferring the patient to the bathroom. (In some facilities, urinals are available for female patients as well as for male patients. If they are available, ask your supervisor to explain the steps of procedure for helping a female patient with a urinal.) Take the patient to a private area (such as a dressing room). Give him a urinal, and then close the curtain for privacy. Check on the patient within five minutes, if not called sooner. If a patient's urinary output is being measured, place the urinal's top over the opening and return it with the patient so the amount can be measured and recorded by the nurse.

A patient on a stretcher or the radiographic table may also use a urinal but will probably need some additional help. The basic steps of procedure for assisting a male patient with a urinal follow:

1. Wash hands.

2. Put on gloves.

3. Explain what you are going to do.

4. Provide privacy.

5. Expose the perineal area.

6. Place the client's penis in the urinal, and lay the urinal between his legs.

7. Make sure urinal is placed at an angle to keep urine from spilling out. Flat edge should be lying on stretcher.

8. Cover the patient's lower body.

9. Remove gloves and dispose of in appropriate container.

10. Wash hands.

11. Leave the room. (Remain near enough to hear the patient if he calls out.)

12. Return to room promptly when the patient calls.

13. Wash hands.

14. Put on gloves.

15. Remove and cover the urinal.

16. If the patient's urinary output is being measured, return the urinal with the patient to his floor. If urinary output is not being measured, take the urinal to the bathroom and empty into toilet.

17. Seal urinal in plastic and return to the appropriate department for sterilization.

18. Remove gloves and dispose of in appropriate container.

19. Wash hands.

20. Give patient a clean, wet washcloth to wash his hands.

21. Make patient comfortable.

Maintaining Patient's Urinary Catheter

Often a patient will have a urinary catheter in place. A **urinary catheter** is a tube placed into the bladder through the urethra. The catheter has a small balloon on the end to keep it in place within the bladder. The opposite end is attached to a collection bag, which must be kept at a level below the patient's bladder. Extra care must be exercised with these patients. Make sure the tubing is out of the way of the patients' feet when they are walking and not coiled beneath them when they are sitting or lying on the table or a stretcher. Care must be taken that a patient does not trip on the tubing and possibly fall or pull the catheter out. Not only does this require replacement of the catheter, but it is also quite painful when the balloon is pulled through the urethra.

Keep in mind that elimination is a private activity. The aide must remember to always offer patients as much privacy as possible and remain sensitive to their feelings.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 4: Assisting with Elimination

Activity Sheet

1. Describe the differences between methods for giving a bedpan to patients who can assist and those who cannot.

2. What device can you use if the patient simply needs to urinate?

3. What precautions must you take with a patient who has a urinary catheter in place?

Clinical/Laboratory Activities

1. With a volunteer from your class acting as a patient (wear appropriate shorts), practice rolling him or her on and off a bedpan. Alternate the role of patient and aide. If a radiology table is not available, use a hard surface like a tabletop. Also practice placing a bedpan for a patient on a stretcher.

2. With a volunteer from your class acting as a patient, practice helping transfer from a wheelchair to a toilet. Hand the "patient" an appropriate amount of toilet paper. Plan and discuss what you would do if the patient is unable to wipe without assistance. On male and female models, practice wiping and cleaning the perineal area. Both the "patient" and the "aide" should wash their hands when finished.

3. Working in pairs and wearing appropriate shorts, tape a long piece of tubing to the "patient's" leg near the groin area to simulate catheter tubing. Attach a plastic bag half filled with water to the other end and hang it on a wheel chair. Practice transferring the "patient" to and from a table top and a stretcher.

4. Ask your clinical supervisor to demonstrte the techniques listed below. With your supervisor's permission and supervision, assist patients with elimination.

   - Assist patients to and from the bathroom.
   - Give and remove a bedpan.
   - Give and remove a urinal.
   - Maintain patient's urinary catheter.

Lesson 5: Assisting in an Emergency

Objectives:

A. Identify the radiology aide's role in assisting professional staff with critically injured or ill patients.

B. Respond to signs and symptoms of patient distress.

C. Follow hospital emergency code procedures.

D. Initiate adult CPR.

Key Terms:

- Signs
- Symptoms
- Respiratory arrest
- Trachea
- Heimlich maneuver
- Heart attack
- Sternum
- Cardiac arrest
- Seizure
- Cardiopulmonary resuscitation (CPR)

Patients in the radiology department are usually in stable condition and can be transported without undue risk, but emergencies may occur in any health care situation. The radiology aide must be prepared to respond promptly to patient distress and must be aware of appropriate emergency procedures. The aide should know what his or her role is in an emergency, and if he or she is alone with the patient, the aide should know what to do until help arrives.

The Radiology Aide's Role in Assisting with Critically Ill or Injured Patients

When a critically ill or injured patient comes to the radiology department from another part of the hospital, he or she will usually be accompanied by a nurse. Patients being transferred from the emergency room after being brought in by ambulance might be accompanied by emergency medical technicians. The aide's role in these cases is to gather any supplies needed for procedures, such as positioning devices and blankets. The aide should also provide assistance to the staff members by communicating information about the procedures and getting any protective equipment, like lead aprons, if the staff members are staying with the patient. In cases in which the patient cannot be moved, the radiology aide may assist in taking a portable x-ray machine to the patient's room, the emergency room, or surgery.

Responding to Signs and Symptoms of Patient Distress

If a life-threatening situation develops, the radiology aide should keep in mind three primary goals: (1) to preserve the patient's life, (2) to prevent further problems, and (3) to get proper medical help as soon as possible. When help is needed, the aide should call a specific person using a calm, firm voice. For example, the aide might say, "Dr. Jones, please come to room 1 immediately." It is important that the patient feel the person with him or her is in control of the situation. The aide must reassure the patient that he or she is in competent hands. After calling for help, the aide should stay with the patient and offer assurance that help is on the way.

The radiology aide must be alert to **signs**, visible changes that can be seen, like swelling or redness; and **symptoms**, the patient's perception of what is happening to him or her. The radiology aide should be aware of the signs and symptoms of the most common life-threatening events: respiratory arrest, heart attacks, and cardiac arrest. These conditions are described below.

Respiratory Arrest

Respiratory arrest is a failure of the body's respiratory system, which prevents the patient from drawing oxygen into his or her lungs. There are three main causes of respiratory arrest:

- Localized area of swelling in the upper respiratory tract,
- Failure of the central nervous system, and
- Choking on an object or a piece of food.

In the first case, the swelling is most commonly caused by an allergic reaction. Such reactions are rare, but they are sometimes associated with the contrast agents used in radiographic procedures to visualize the kidneys. When a patient has a reaction, his or her breathing sounds progressively more labored, and the patient may complain that breathing is becoming difficult. The patient's lips may begin to have a blue or purplish cast to them, and the beds of the fingernails may also look blue. As the swelling worsens, the patient may become anxious and express feelings of impending doom.

As mentioned before, reactions of this type are rare, and it is difficult to predict when they will occur. Often symptoms begin almost immediately after IV injection of the contrast media. However, the onset of the symptoms can occur after the exam is completed, perhaps during transport back to the room. Because of the unpredictability of this reaction, the radiology aide must watch the patient carefully for signs of distress during the test and ask the patient how he or she is feeling.

Respiratory arrest that occurs as a result of central nervous system failure is generally caused by an overdose of narcotics, drug abuse, or a severe head injury. A patient in this condition requires artificial ventilation. The patient is usually in respiratory arrest when he or she is admitted to the hospital and comes to the radiology department from units such as intensive care. This type of patient may have special equipment attached to his or her mouth or throat. If this is the case, get instructions from the attending caregiver before transporting or preparing the patient for an examination. Ask your supervisor for guidance if you have any doubts about how to safely prepare the patient.

Respiratory arrest can also occur when a person swallows a piece of food that has not been completely chewed. The food goes down the **trachea**, or windpipe, instead of the esophagus. The food then becomes lodged in the trachea, blocking it and cutting off the air supply to the lungs. All health care workers, should be familiar with the **Heimlich maneuver**, which is the procedure used to clear the obstructing object from the trachea.

There are different procedures for use on conscious and unconscious adults, and children, pregnant women, and infants. The methods are thoroughly covered in the *Health Care Assistant Core* and should be reviewed.

Heart Attacks and Cardiac Arrest

Heart attacks occur when the arteries that supply the heart muscle with blood become blocked as a result of a blood clot

or coronary artery disease. The aide will usually have to depend on the patient's description of symptoms to recognize a heart attack. When a patient is having a heart attack, he or she will usually complain of sudden intense pain in the chest. Usually the patient will point to the area of the **sternum**, or breast bone, as the place where the pain is centered. The patient may also feel an intense tightening of the chest as though there was a heavy weight on his or her chest. Victims of a heart attack often feel pain extending up into both sides of the neck or a sharp pain extending into the left shoulder. The victim may also complain of sudden nausea and a feeling that he or she needs to have a bowel movement.

The radiology aide should call for help immediately. The aide should then stay with the patient and provide reassurance. The patient should be made as comfortable as possible, and if he or she is complaining of shortness of breath, the head of the bed or stretcher may be raised. The aide may apply oxygen if it is available and if he or she knows how to operate the equipment.

Cardiac arrest, when the heart suddenly stops beating, is the most severe outcome of a heart attack. Cardiac arrest is also a rare side effect of IVP contrast injection. The patient may seem fine one moment and lose consciousness the next. If this happens, the patient's airway should be checked to ascertain if he or she is still breathing, and the heartbeat checked by feeling for a carotid pulse. The pulse should be easily detectable if it is present. If the aide is unable to detect a pulse, he or she should call for assistance immediately. The supervisor or radiographer will instruct the aide on summoning a "Code Team," or emergency team.

Emergency Code Procedures

Each hospital has its own emergency code procedures for life-threatening situations. "Paging Dr. Blue" or the phrase "Code Blue" followed by the location of the patient is usually announced over the hospital's public address system. The aide should become familiar with the procedure in his or her facility, studying it until he or she feels comfortable with the entire procedure. Review the procedure on a weekly or monthly basis.

It should be noted that not all hospital emergency codes deal with medical emergencies. Hospitals also have emergency contingency plans in place to deal with fires, tornadoes, and other natural disasters. These too, are announced over the public address system, usually as "Code Red" or a page for "Dr. Red." The aide should become familiar with all of these emergency codes and be prepared to respond appropriately if one is called.

Other Problems

Radiology aides often have to assist patients who are made ill by the examinations themselves. Swallowing the barium preparation for an upper GI or receiving an IVP contrast agent may cause a patient to become nauseated. In these situations, the aide should reassure the patient and have him or her take short, panting breaths through the mouth. A cool washcloth placed across the forehead may help.

If the nausea does not pass and the patient says that he or she is going to vomit, the aide should hand him or her an emesis basin immediately. If the patient is lying down, the aide should try to raise him or her into a supported sitting position. If the patient cannot sit upright, he or she

should be rolled onto the *right* side with the head turned to the right. This will reduce the chance that the patient will breath in the vomited material. After the patient is through vomiting, the aide should supply the patient with water to rinse the mouth and with tissues to wipe the lips.

Patients with seizure disorders are frequently seen in radiology departments for diagnostic procedures. A **seizure** is a loss of consciousness followed by violent, involuntary contraction and relaxation of the muscles. Should a patient experience a seizure, the aide's responsibility is to keep him or her as safe as possible.

A patient who suffers from these disorders can often tell when a major attack is about to begin. The seizure may be preceded by an auditory or olfactory sign that can be sensed by the patient. The patient may hear bells or certain tones, or he or she may detect the smell of oranges or some other specific odor. The patient may even state, "I am going to have an attack."

Often as the seizure begins, the patient will vocalize a hoarse cry as the abdominal and chest muscles contract and force the air out of the lungs. The aide should assist the patient to lie down and remove anything that may cause injury. Padding should be placed under the patient's head. *The aide should not attempt to restrain or hold the patient down.* After the patient loses consciousness, his or her back will arch as the muscles contract. There will be a period of alternating contraction and relaxation of the muscles until the seizure ends and the patient regains consciousness. Immediately following the seizure, the patient may become irritable and wish to sleep.

A seizure can be frightening to witness. However, it will pass, and the patient is very likely familiar with the experience. The most important thing the radiology aide can do is to keep the patient safe and be an accurate observer. He or she should watch the patient carefully and observe if the contractions were equal in intensity on both sides of the body. Did the contractions start in one place and progress to another? These observations may be helpful to the physician in determining the nature of the disorder.

CPR

In the case of cardiac or respiratory arrest, it may be necessary for the aide to begin **cardiopulmonary resuscitation (CPR)** while waiting for the code team to arrive. CPR is an artificial means of keeping blood flowing and air moving through the lungs of a patient. Most hospitals now require all employees to have CPR certification. All health care workers--radiology aides included--should have formal CPR training. Instruction offered in classes is up to date and reflects current trends in treatment.

Once the code team arrives (usually within three minutes of the page) the radiology aide may feel that his or her help is no longer needed. There are, however, many things that can be done to assist the team. The aide may need to bring in the department's crash cart. Accurate recordkeeping of when the attack began and when the code team arrived is very important. It may be necessary for the aide to become a "gofer" for the code team. He or she may have to call for additional personnel or stay by the phone. There may be other patients in the area that require the aide's attention while the team assists the patient who is in distress.

Test Your Knowledge: Complete the following activity sheet to test your

knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheet, you may complete the skill sheets and take the written unit evaluation. A score of at least 80 percent indicates you may proceed to the next unit.

Lesson 5: Assisting in an Emergency

Activity Sheet

1. List the radiology aide's three primary goals in an emergency situation.

   a.

   b.

   c.

2. List the three causes of respiratory arrest.

   a.

   b.

   c.

3. List two signs of a patient in respiratory failure.

   a.

   b.

4. What is the difference between a heart attack and cardiac arrest?

5. List four signs of a heart attack.

   a.

   b.

   c.

   d.

6. Why is it necessary to roll a patient onto his or her right side when he or she vomits?

7. List four things you should do (or not do) when a patient has a seizure.

   a.

   b.

   c.

   d.

Clinical/Laboratory Activities

1. Locate the Policy and Procedure Manual in your clinical area. Read the sections pertaining to emergency procedures. Prepare a report outlining procedures relating to:

   a. Patient emergencies discussed in the text.
   b. Fire
   c. Disaster (severe weather, etc.)

2. Take a CPR course (available through the American Heart Association and the American Red Cross). Show your certification card to your instructor.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet: Safety Rating _____
Comments: _____

_____

Activity Sheet: Assisting Patients with IVs Rating _____
Comments: _____

_____

Skill Sheet: Gown IV Therapy Patients Rating _____
Activity Sheet: Transferring and Transporting Patients Rating _____
Comments: _____

_____

Skill Sheet: Stand and Pivot Transfer (Active-Assisted) Rating _____
Skill Sheet: Stand and Pivot Transfer (Passive-Assisted) Rating _____
Skill Sheet: Swing Transfer Rating _____
Skill Sheet: Sliding Board Transfer Rating _____
Skill Sheet: Sliding Transfer Rating _____
Skill Sheet: Wheelchair Transfers Rating _____
Skill Sheet: Transport Via Wheelchair Rating _____
Skill Sheet: Transport Via Stretcher Rating _____
Activity Sheet: Assisting with Elimination Rating _____
Comments: _____

_____

Skill Sheet: Give and Remove a Bedpan Rating _____
Skill Sheet: Give and Remove a Urinal Rating _____
Activity Sheet: Assisting in an Emergency Rating _____
Comments: _____

_____

Written Unit Evaluation Score _____
Additional Comments: _____

_____

_____

Teacher Signature _____ Date _____
Student Signature _____ Date _____

Unit IV

Radiographic Room Responsibilities

This unit will introduce the prospective radiology aide to basic operations in the radiology department. The aide must know how to safely set up for and assist with patient examinations and how to clean up the radiographic room afterward.

The aide may also, along with other members of the staff, be responsible for maintaining the radiographic room and monitoring use of and restocking supplies.

Unit Lessons

Introduction to Radiology Procedures

Assisting in the Radiographic Room

Cleaning the Radiographic Room

Lesson 1: Introduction to Radiology Procedures

Objectives:

A. Identify basic radiation safety precautions.

B. Follow radiation safety practices.

C. Identify directional terms and abbreviations.

D. Identify types of radiographic procedures and common radiographs.

Key Terms:

- Dosimeter
- Projection
- Position
- KUB (kidney, ureter, and bladder) radiograph
- Fluoroscope
- Contrast media
- Upper GI
- Lower GI
- Intravenous pyelogram (IVP)
- Double-contrast exam

One of the most important aspects of any radiology procedure is radiation safety. The hazards of radiation were discussed briefly in a previous lesson. Basic safety information and standard precautions will be covered in this lesson. There are many ways a radiology aide can protect him- or herself from radiation's harmful effects. The radiographer also uses many different techniques, types of equipment, and accessories to ensure that the patient being radiographed receives the smallest possible dose of x-radiation, while a quality radiograph is obtained for diagnosis. It is essential that the radiology aide know and practice radiation safety at all times.

Basic Radiation Safety Precautions

As a radiology team member, the aide must be aware that radiation from the primary beam (rays that come from the x-ray tube) is not the only safety concern. Only a small part of the primary beam actually penetrates the body and exposes the radiographic film. Secondary, or scatter, radiation is generally of lower intensity than the radiation in the primary beam, but it can cause harm over time. Radiation cannot be detected by any of our senses (see Figure 1.1). Therefore, safety precautions should always be taken. Ionizing radiation, which makes the radiographic image, produces biological changes in living tissue. These changes can be divided into two categories:

1. Long-term - Long-term effects of radiation manifest themselves years after the exposure. These delayed effects may be from one very high-level exposure or multiple low-level exposures. Long-term effects of excessive radiation exposure

Figure 1.1 - Caution Statement

CAUTION: Don't overlook the dangers of radiation.

You cannot detect the presence of radiation; it is colorless and odorless, and you cannot feel it penetrate your body.

Radiation safety must be practiced at all times.

include cancerous tumors, leukemia, cataracts, birth defects, and shortened life expectancy.

2. Short-term - Short-term or acute effects of radiation usually result from a high dose to the entire body, as in the case of radiation treatment for cancer. Symptoms may include nausea, vomiting, diarrhea, erythema (reddening of the skin), and loss of hair.

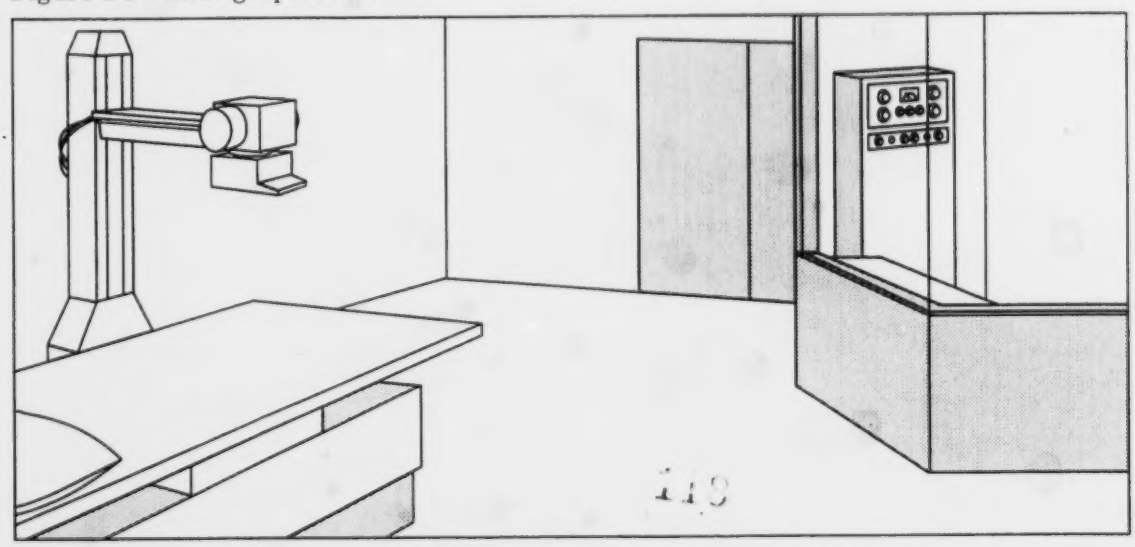
For the radiology worker, the danger from radiation is minimal when proper safety precautions are observed. A radiology aide, radiologist, or radiographer can work a lifetime without jeopardizing his or her health or receiving more radiation than most people in other occupations.

Safety Precautions

The easiest, most effective way to be safe from radiation is to *maintain the greatest possible distance from the x-ray source.* The farther the radiology aide is from the x-ray tube during an exposure, the less radiation he or she will receive. Besides distance, radiology workers are also protected by specially constructed barriers to radiation. X-radiation cannot penetrate lead. The radiology department (see Figure 1.2) is carefully planned and constructed with leaded walls and doors. The glass and plastic windows in the rooms are also leaded. Although close to the source of radiation, the control booth is the safest place in the radiographic room. It is well shielded and nearly radiation free. There are state and federal regulations governing the construction of the radiographic rooms and surrounding areas.

Another basic precaution is regular maintenance of equipment. Every piece of radiation-producing equipment must meet the standards of various regulatory commissions. The equipment is checked at least annually by a radiation physicist. His or her job is to make sure the equipment is working safely--not leaking or scattering radiation--and performing at peak efficiency.

Figure 1.2 - Radiographic Room



Following Radiation Safety Practices

Radiology department or nursing staff often find it necessary to be with the patient during x-ray exposures (with trauma victims and for fluoroscopy and portable exams). Lead is used to protect radiation workers and individual patients. Aprons containing lead may be worn by workers and often by patients. Specially shaped lead sheets coated with vinyl and rubber are used to shield certain organs and sensitive parts of the body (see Figure 1.3). Tissues vary according to their sensitivity to ionizing radiation. Thus, the amount of radiation required to produce damage varies according to the type of cell. Young, rapidly dividing cells are more radiosensitive than older cells. The chart in Figure 1.4 shows examples of cell sensitivity in descending order. Some sensitive areas cannot be protected by standard lead aprons. Shields are worn to protect the thyroid gland (neck collars), the eyes (leaded glasses), and hands (leaded gloves).

Figure 1.3 - Radiology Aide Wearing Leaded Apron, Gloves, and Glasses

Figure 1.4 - Tissue Sensitivity

a.	High	Lymphatic Tissue Bone Marrow Reproductive Cells
b.	Medium	Lens of Eye Skin Salivary Glands Mature Bone
c.	Low	Muscle Tissue Nerve Tissue

A pregnant patient or staff member requires special consideration when x-rays are being used. Newly formed cells, such as those in a fetus, are very susceptible to the harmful effects of radiation. However, a pregnant patient may have an illness or injury that is unrelated to her pregnancy that requires a radiographic examination, such as a broken ankle or an injured knee. In this case the physician must determine if the radiographic examination is absolutely necessary. If it is determined that a radiograph is required, the patient's abdomen is carefully shielded during the examination.

Each female radiology worker must read and sign a statement of agreement indicating her understanding of the dangers of radiation to an unborn fetus (see Figure 1.5). A pregnant radiology aide or radiology staff member must notify her supervisor as soon as she knows she is pregnant. She should be counseled regarding any changes to her duties and any additional safety precautions she is obligated to take. She must monitor her exposure record closely. Department

Figure 1.5 - Statement of Agreement

Statement of Agreement for Female Radiation Worker

I, the undersigned, have been counseled and understand the dangers of radiation to the unborn fetus, especially in the first trimester of life. In the event I become pregnant, I will immediately notify my supervisor. I agree to abide by the policies of this department regarding pregnant radiation workers. If I am allowed to remain in the department, I will continue to practice radiation safety. I understand that during my pregnancy, the amount of radiation I receive will not exceed 0.5 rems (500 mr).

Name: _____

Date: _____

Supervisor: _____

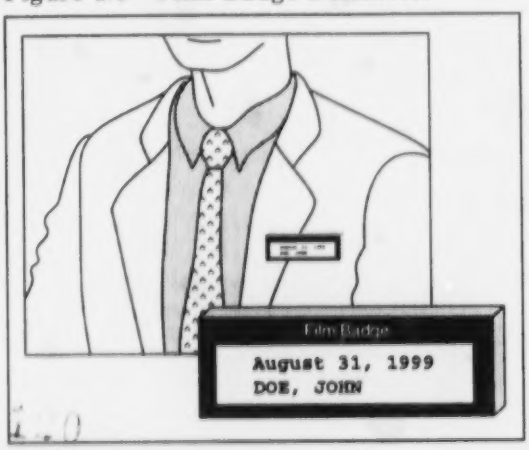
Witness: _____

policies vary on the amount of exposure allowed for pregnant radiology staff members. Some facilities allow their pregnant personnel to continue working in the the department; others do not. Frequently, the types of examinations with which they can assist are limited. For example, they might not be permitted to assist with exams in which they might be directly exposed to x-rays, such as fluoroscopic or portable exams. Some facilities require the pregnant worker to sign a liability waiver.

A student radiology aide who becomes pregnant during the course (or is pregnant at the start of the course) must immediately inform the course instructor. This is to ensure the safety of the student and the baby. The student must sign a statement of agreement that includes information regarding radiation safety before she can continue the course.

All radiology personnel must monitor their radiation exposure. Most departments give each worker a **dosimeter**, which measures radiation through an element that changes chemically as it is exposed to radiation. Dosimeters come in various shapes and sizes; the most common is the film badge (see Figure 1.6). The film badge is worn by the worker for a period of time, usually one month, and then analyzed for radiation exposure. Special labs analyze the dosimeters for hospitals and clinics. A record is maintained of each individual's exposure history during his or her career as a radiation worker. Opinions on where the dosimeter should be worn vary, but most often it is worn on the shirt or jacket collar. The dosimeter should be worn whenever the radiology aide is working in the department. It is vital to his or her

Figure 1.6 - Film Badge Dosimeter



safety to accurately record radiation exposure.

Directional Terms and Abbreviations

The aide must be familiar with the directional terms and abbreviations the radiographer might use to indicate how a patient should be adjusted for the best possible radiograph.

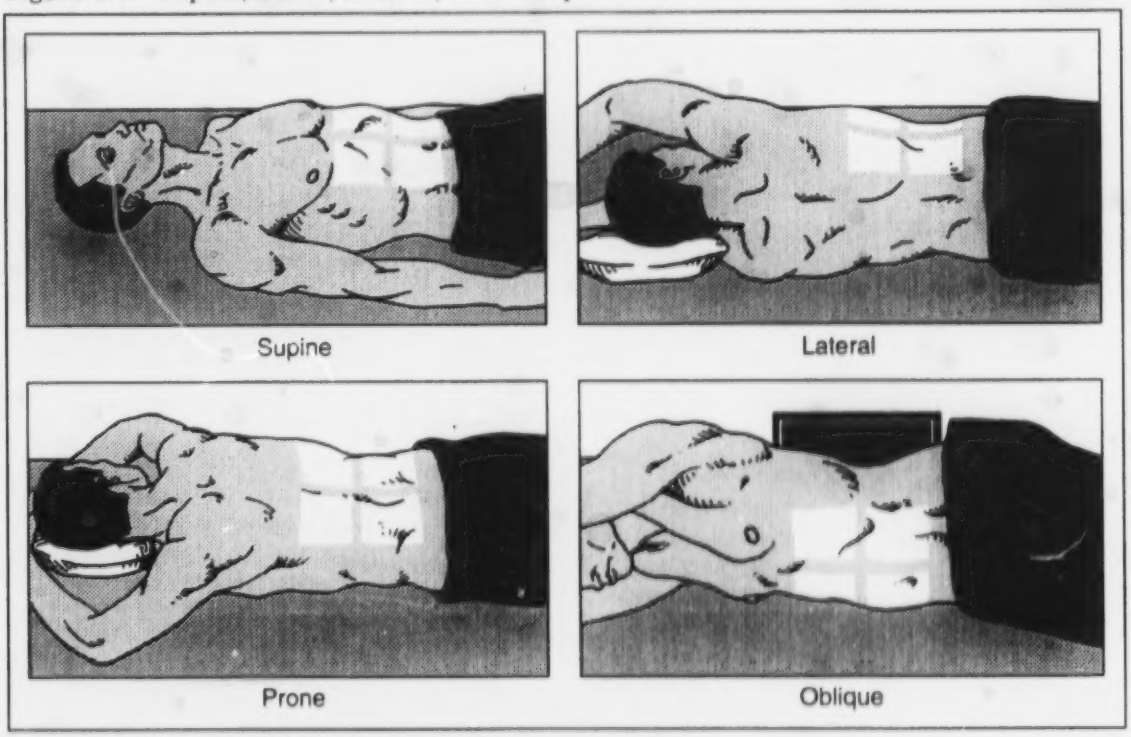
Projection

The term **projection** refers to the direction the x-ray travels through the body. There are three basic projections. In the chest radiograph, for example, when the patient is facing the film with his or her back to the x-ray tube, the x-ray travels through the patient from back to front. This type of projection is called a posterior-anterior (P.A.) projection. When the patient faces the x-ray tube with his or her back to the film, it is called an anterior-posterior (A.P.) projection. When the x-ray beam travels from one side, or lateral aspect, of the patient to the other, it is referred to as a lateral (Lat.) projection. Radiologists or physicians often specify A.P., P.A., or Lat., depending on what they are looking for in the radiograph.

Position

Patients who are very ill or seriously injured, who cannot sit or stand, or who are confused can be a challenge to the radiology aide and the radiographer. It is often difficult to get them into a good position for the correct projection. **Position** refers to the placement of the body or body part in a specific pose to achieve the desired radiograph. There are four basic ways for a patient to lie on the radiographic table (see Figure 1.7):

Figure 1.7 - Supine, Prone, Lateral, and Oblique Views



- Supine - flat on the back
- Prone - flat on the stomach
- Oblique - somewhere between prone and supine (usually 30-45 degrees)
- Lateral - lying on the side

One of the jobs of the radiographer is to make sure all radiographs are properly marked so the radiologist can make an accurate diagnosis. If a P.A. projection is usually a part of the routine and an A.P. projection is used instead, it must be indicated on the radiograph. If a chest radiograph is performed with the patient sitting or lying down rather than standing, this information must be indicated on the radiograph because this positioning may cause the size of the heart to appear larger than its actual size.

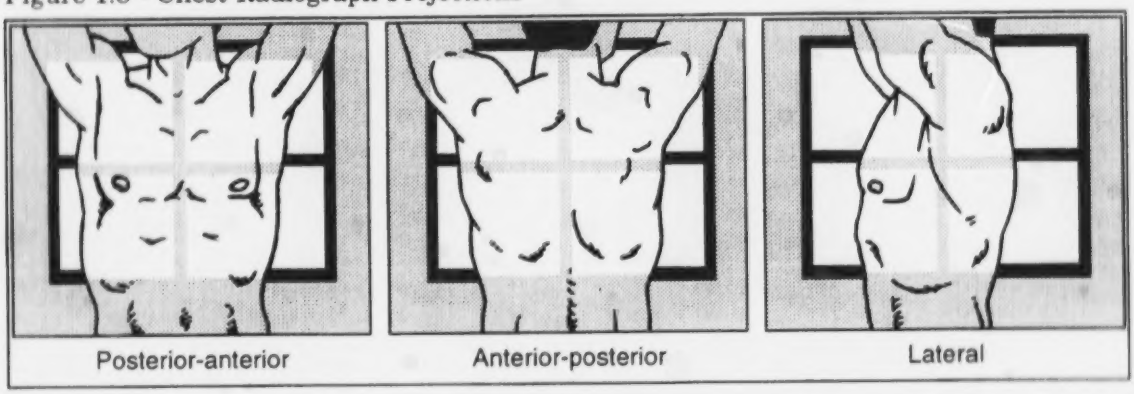
Types of Radiographic Procedures and Common Radiographs

There are literally hundreds of different radiographic exams used to diagnose problems for parts of the human body. The radiographer uses a combination of physical techniques and mechanical aids to help patients assume certain positions in order to photograph specific body parts. Tube angles, sponges, radiolucent blocks (which do not show up on radiographs), sandbags, and head holders are some of the tools used to help patients get into these positions. It is important that the radiology aide be familiar with the common types of exams and the basic positions used in these exams. The aide and the radiographer can communicate more easily and speed up the exam time if most procedures do not need to be explained.

Chest Radiographs

The chest radiograph is one of the most commonly performed exams in the radiology department. The physician can learn a lot about the patient's general condition by looking at the chest radiograph. Pneumonia, bronchitis, and emphysema are a few conditions of the lung that can be diagnosed using the chest radiograph. The size and shape of the heart are also important factors for the physician to examine and can aid in diagnosing some heart ailments. This exam is usually performed with the x-ray tube at a distance of 72 inches (6 feet) from the film. The distance is important because at 6 feet the heart will appear close to its actual size. If the radiograph is taken at a different distance, it should always be noted on the film. The routine chest radiograph consists of two different projections: lateral and either anterior-posterior or posterior anterior. The posterior-anterior projection is preferred. (See Figure 1.8). If the patient is capable of

Figure 1.8 - Chest Radiograph Projections



Radiographic Room Responsibilities, page 4.8

standing, the chest radiograph is taken with the patient facing the radiographic film, which is on a chest stand, with his or her back to the x-ray tube. After the first exposure is made, a new film is placed in the chest stand and the patient is turned with his or her side (usually the left side) against the film for the lateral projection. Chest radiographs should be taken with the patient upright. This allows for demonstration of air or fluid levels in the chest.

Orthopedic Radiographs

Extremity radiographs (those of arms, legs, hands, feet, wrists, ankles, fingers, and toes) are often requested due to trauma, such as falls, sports-related injuries, or moving vehicle accidents. Pain not caused by trauma, such as arthritis, bursitis, and tendinitis, is also diagnosed with this type of radiograph. Exams are frequently performed with the body part directly on the film cassette. At least two projections of the same part are radiographed to aid the radiologist in making a diagnosis. Radiographs of the lower extremities are usually taken with the patient lying on the radiographic table or stretcher. Radiographs of the upper extremities are taken with the patient sitting, lying, or standing. Various positions are used to obtain radiographs of the shoulders, knees, pelvis, hips, ribs, skull, and spine.

Abdominal Radiographs

Abdominal radiographs are commonly performed in the radiology department. These exams are performed with the patient supine or upright, using A.P. projections. Radiographs of the abdomen with the patient prone (P.A. projection) may also be requested by the radiologist. Lateral projections of the abdomen may be requested, especially when the physician is looking for foreign bodies in the abdomen or is interested in the abdominal aorta. Sometimes a lateral radiograph of the abdomen is requested. This exam differs from the normal lateral exam in that the beam travels from front to back or back to front rather than from side to side. This is achieved by rolling the patient onto his or her side (usually the right side). Instead of the x-ray tube being above the patient, it is maneuvered to be level with the patient and parallel to the floor. For an A.P. projection, the x-ray tube is placed in front of the patient, and a cassette is placed in back of the patient. For a P.A. projection, the x-ray tube is placed in back of the patient, and the cassette in front. Another common type of abdominal radiograph is the **KUB (kidney, ureter, and bladder) radiograph**, which is used to determine the location and size of the kidneys.

Fluoroscopy

Some organs, such as the stomach and colon, are not well visualized through standard radiography. To enhance these organs, a special device is used in conjunction with substances that highlight organs. The device is a **fluoroscope,** a special kind of x-ray machine that uses x-radiation and connects to an image intensifier to project the image onto a fluorescent screen. In the past, the operator was the only person who could see the image, but today most fluoroscopes are attached to television monitors that enable everyone in the radiographic room to watch the exam. **Contrast media** are the substances that cause organs or structures that would not normally be seen to show up on a radiograph. Barium sulfate and liquid contrast media containing iodine are the most common types. Barium sulfate is taken orally or introduced through the rectum, while contrast media containing iodine are often injected into patients' veins. In addition to its use in fluoroscopy, intravenous (IV) contrast media are frequently used in CT scans and MRI. The

technological advance of fluoroscopy has been of tremendous value in diagnosing illness and injury.

Contrast Studies

Three common radiographic procedures using contrast media are:

- the **upper GI** (gastrointestinal), an examination of the esophagus, stomach, duodenum, and small intestine or bowel,
- the **lower GI**, an examination of the large intestine, and
- the **intravenous pyelogram (IVP),** an examination of the kidneys that shows how they function.

During an upper GI the fluoroscope is used to watch as the patient drinks a barium "milkshake," a mixture of barium powder and water. The radiographer then observes as the liquid flows down the esophagus into the stomach and empties into the small intestine. The radiologist takes spot films of significant events throughout the exam. After the fluoroscopic exam is complete, radiographs can be taken while the barium is still present. For the small intestine or bowel, the patient usually drinks two cups of barium. The radiographer takes abdomen films at timed intervals (usually ever 15 to 30 minutes) until the barium reaches the large intestine. A lower GI is similar, except the barium is given as an enema and fills the large intestine.

During an intravenous contrast exam, the contrast medium is injected into a patient's vein, usually in the arm. As the contrast medium circulates through the urinary system, problem areas can be detected. This type of exam can also be used to detect problems with some major organs. The IVP is commonly used to diagnose kidney stones, cysts, and bladder tumors.

A **double-contrast exam** uses air as one contrast medium and barium as the other. In an upper GI, the patient swallows some crystals containing carbon dioxide. The crystals cause the stomach to distend. The barium coats the lining of the stomach, creating a double contrast. The barium appears white, while the gas, or air, appears dark. The same effect can be achieved with the barium enema during a lower GI. The air is pumped into the large intestine through the enema tip.

Double-contrast exams are superior to those using only barium, but they require total cooperation from the patient. Contrast and double-contrast exams often cause the patient a great deal of discomfort. The radiology aide can help the patient get through the exam by empathizing and maintaining a professional manner. Establishing rapport with the patient and answering any questions early on will prevent confusion. It will also save time, which is important. Contrast exams must be performed within a limited time after the media are introduced into the patient. A contrast study has a much better chance of success if the aide understands the entire process.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Introduction to Radiology Procedures

Activity Sheet

1. List two types of biological changes caused by radiation.

   a.

   b.

2. What is the most effective way to protect yourself from radiation?

3. What protective material is built into the walls of radiology departments?

4. List three items of protective gear worn by radiology workers.

   a.

   b.

   c.

5. In the radiology department, why does a patient or a staff member require special consideration when she becomes pregnant?

6. List one example each of tissues that are of high, medium, and low sensitivity to radiation.

   High:

   Medium:

   Low:

7. What is a dosimeter used for? How long should it be worn? What should be done with it at the end of that time?

8. List the three basic projections for radiographs and their abbreviations.

   a.

   b.

   c.

9. List the four basic positions in which patients are posed for radiographs.

   a.

   b.

   c.

   d.

10. What is the most common type of radiograph in a general radiology department? At what distance is this radiograph taken? Why?

11. What does the abbreviation KUB stand for?

12. List three types of radiographic exams that use contrast media?

    a.

    b.

    c.

Clinical/Laboratory Activities

1. Ask the radiographer to hang several different types of radiographs on the view box. Try to identify each type. Try to identify the basic position and projection the patient was in when the radiograph was taken.

2. Ask the radiographer to hang a single contrast barium enema and an air contrast enema on the view box. See if you can identify the differences in the radiographs.

3. How many radiographic rooms are there in your clinical site? How many of these are R/F (radiographic/fluoroscopic) rooms?

4. Ask your clinical supervisor if you can see radiographs for the procedures listed below. What differences do you see between an A.P. and a P.A. projection of the same area?

   a. Chest radiograph A.P. projection
   b. Chest radiograph P.A. projection
   c. Abdominal radiograph A.P. projection
   d. Abdominal radiograph P.A. projection

5. Ask your clinical supervisor if you can see various orthopedic radiographs.

Lesson 2: Assisting in the Radiographic Room

Objectives:

A. Identify radiographic cassettes by size and type.

B. Prepare the patient and his or her records for the exam.

C. Set up room for an orthopedic exam.

D. Set up room for a chest exam.

E. Mix the barium preparation.

F. Set up room for an upper GI exam.

G. Set up room for a lower GI exam.

H. Set up room for an IVP.

I. Assist radiographer to position patients for radiographs.

Key Terms:

- Cassette
- Scout film
- Informed consent form

An important responsibility of the radiology aide is setting up the room and equipment for exams. In radiology, as in many trades and professions, having the correct tool is half the job. An experienced radiology aide who knows the requirements for each of the various procedures can work virtually unsupervised, allowing the radiographer or technologist more time to concentrate on the other aspects of the procedure.

Identifying Radiographic Cassettes by Size and Type

In radiology, a **cassette** is the light-tight metal or plastic film holder. Intensifying screens are mounted inside radiographic film cassettes. The screens are made of a durable base coated with chemicals that fluoresce when struck by x-radiation film. Prior to the invention of the intensifying screen, the quantity of x-radiation required to expose the radiographic film was many times greater and more dangerous than the quantity used today. Radiographic film cassettes usually contain two intensifying screens (one in front and one in the back of the cassette) with the film sandwiched in between, but some specialized cassettes contain only one intensifying screen.

The type and size of the cassette used are primarily determined by the type of procedure and the specific part or parts of the body to be radiographed. The film used in radiographs is also classified by size and by type. A radiograph of a broken finger, for example, would require a much smaller film than would a chest radiograph. Some of the more common cassette sizes are 8 x 10 in. (18 x 24 cm), 9 x 9 in. (24 x 24 cm), 10 x 12 in. (24 x 30 cm), 11 x 14 in. (30 x 35 cm), 14 x 14 in. (35 x 35 cm), 14 x 17 in. (35 x 43 cm), and 7 x 17 in. (18 x 43 cm).

Common cassette types include:

- General radiography cassettes, which can be used for nearly any type of radiograph,
- Extremity or detail cassettes, which are used for extremities where very fine detail is required, and
- Grid cassettes, which are often used for thicker body parts (e.g., femurs,

chests, and abdomens), in portable work, and with contrast media. These cassettes have hundreds of very fine parallel lines made of lead built into the front. These lines absorb scatter radiation, which helps the radiographer get a clearer picture.

Preparing the Patient and His or Her Records

The radiology aide can complete several steps prior to gathering supplies and preparing equipment. The aide should:

1. Obtain the patient's file jacket. It can usually be found in either the records department, if the aide is working in a hospital setting, or in the radiology department's file section at a clinic.

2. Review the jacket. Most film cases list contents by type of radiograph and date. If the patient has had an exam of this type previously, pull the previous films and the radiologist's report.

3. Stack the old reports on top of the old radiographs and attach them to the front of the film jacket.

4. Put the current requisition and a flash card on top of this packet.

5. Place the packet in the ready bin for the radiographer.

6. *Patients who do not need assistance*
   a. Escort the patient to the changing area.
   b. Explain which articles of clothing must be removed, usually everything except the underpants (unless a barium enema is being done; then everything must be removed).
   c. Instruct the patient to put on a patient gown and remain in the changing area until you return to take him or her into a radiographic room for the examination.

   Patients who need assistance
   a. Assist the patient to the changing area.
   b. Help the patient remove all necessary articles of clothing, leaving only underpants (unless a barium enema is being done; then everything must be removed).
   c. Assist the patient to put on a gown, and then assist the patient to the radiographic room.

Setting Up for an Orthopedic Exam

Room preparation is probably easiest for radiography of the chest and for orthopedic exams of bones and joints.

1. Prepare the patient and his or her records, then

2. Make sure there are enough cassettes in the correct size on hand for the exam.

3. Check the cassettes to make sure they are clean.

4. Make sure the radiographic table is clean and the pillowcase is fresh.

5. Assist the patient to the radiographic room.

6. Help the patient onto the table, if necessary. If the patient does not need to be on the table for the exam, help him or her to a chair and explain

that the radiographer will arrive momentarily to perform the exam.

7. Place the patient's flash card in the ID camera. The room is prepared for the radiographic exam.

Setting Up for a Chest Exam

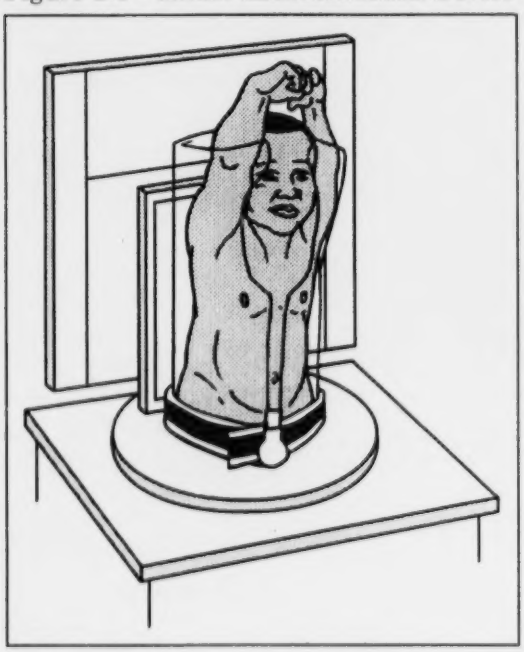
1. Prepare the patient and his or her records, then:

2. Make sure there are two general radiography cassettes available: 14 x 17 in. (35 x 43 cm) for adults and 11 x 14 in. (30 x 35 cm) or 10 x 12 in. (24 x 30 cm) for infants.

3. Be sure the outside of the cassettes is clean.

4. Check to ensure the chest stand, radiographic table, or immobilization device for infants has been cleaned since the previous exam. (See Figure 2.1)

Figure 2.1 - Infant Immobilization Device



5. Assist the patient to the radiographic room.

6. Help the patient onto the table if necessary. If the patient does not need to be on the table for the exam, help him or her to a chair and explain that the radiographer will arrive momentarily to perform the exam.

7. Place the patient's flash card in the ID camera. The room is prepared for the exam.

Mixing the Barium Preparation

The radiology aide can be a great asset to the radiographer when performing contrast studies. The quality of the radiograph is often dependent on the timing of the radiology team. When barium is used as a contrast media, the radiology aide is often the one who mixes it. All mixtures are shaken for 20 to 30 seconds immediately after the water is added. The preparation is shaken again just prior to use.

The consistency of the barium mix will vary with departments. Each radiologist has a preference in barium thickness. The type of exam also dictates the desired consistency; the barium mix used to study the esophagus is thicker than that used to examine the stomach. The mix for a single-contrast exam is often thinner than that for a double-contrast exam. The upper GI cups and barium enema bags are marked with lines that indicate various consistencies. (See Figures 2.2 and 2.3.) Water is added to achieve the desired thickness. The lower markings indicate a thick mix, while the higher markings indicate a thin mix. The radiology aide should ask the supervisor which levels the department uses for specific exams.

Figure 2.2 - Upper GI Cup

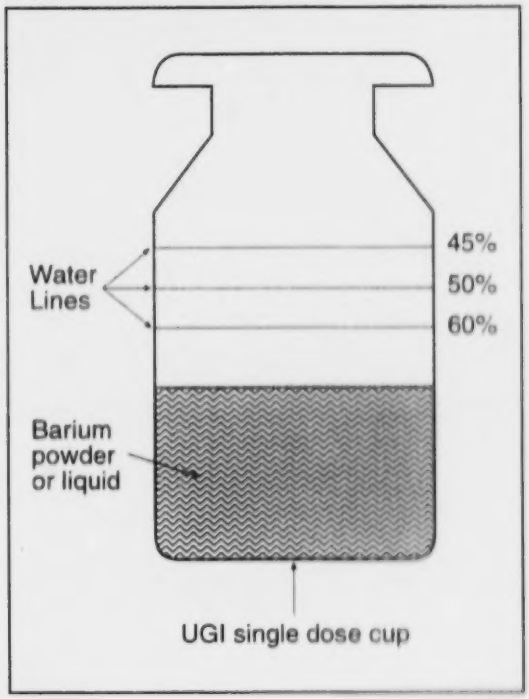
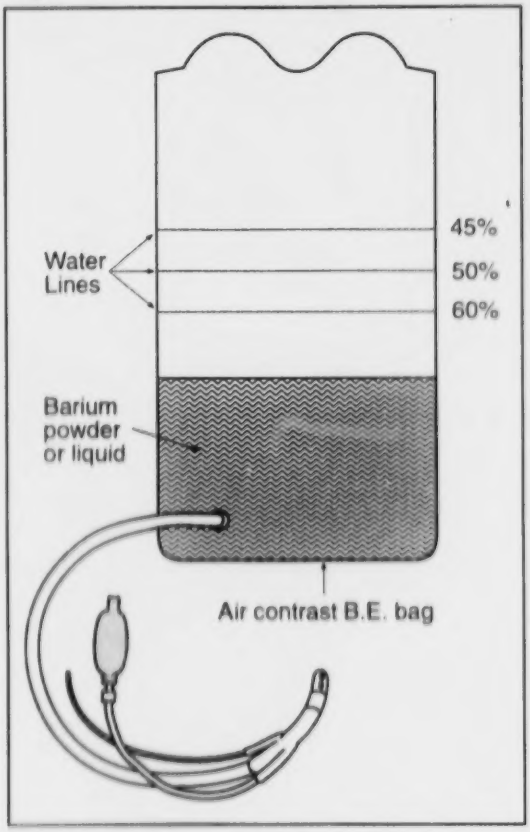


Figure 2.3 - Barium Enema Bag



Setting Up for an Upper GI Exam

1. Prepare the patient and his or her records, then:
2. Mix the barium preparation according to the radiologist's preference.
3. Shake well for 20 to 30 seconds.
4. Place a drinking cup and/or straw next to the barium cup.
5. Put the packet of gas granules (if doing a double-contrast exam) next to the barium cup.
6. Make sure there are six general purpose cassettes, including two 14 x 17 in. (35 x 43 cm), two 11 x 14 in. (30 x 35 cm), and two 10 x 12 in. (24 x 30 cm) on hand.
7. Set out enough lead aprons for the personnel involved in the exam.
8. Place the flash card in the ID camera and flash one 14 x 17 in. (35 x 43 cm) cassette with the patient ID.
9. Place this film in the table bucky (a film holder underneath the table top).
10. Place the footboard on the table.
11. When the patient is gowned, assist him or her to the radiographic room and onto the radiographic table.
12. Help the patient assume the supine position for the A.P. scout film. A **scout film** is the initial large radiograph that gives the

radiographer an overview of the condition of the patient.

13. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see.

14. Angle the radiographic table to the vertical position.

15. Position the monitor for easy viewing by the radiologist. The room is now prepared for the upper GI exam.

Setting Up for a Lower GI Exam

1. Preparing the patient and his or her records, then:

2. Mix the barium preparation.

3. Shake well for 20 to 30 seconds.
4. Fill the enema bag.

5. Attach the components (air bulb to the larger tube, air insufflator to the smaller tube).

6. Hang the bag on the IV pole.

7. Set out lead aprons for the personnel involved in the exam. Also, the following equipment should be laid out and available for the radiographer:

    - one pair of disposable gloves,
    - one pair of leaded gloves,
    - tube or packet of lubricating gel,
    - one pair of hemostats,
    - four to five spot films,
    - four to six 14 x 17 in. general radiology cassettes,
    - two 11 x 14 in. general radiology cassettes, and
    - two 14 x 17 in. grid cassettes.

8. Place the flash card in the ID camera and flash one 14 x 17 in. cassette with the patient ID.

9. Place this film in the table bucky.

10. Place the footboard on the table.

11. When the patient is gowned, assist him or her to the radiographic room and onto the radiographic table.

12. Help the patient assume the supine position for the A.P. scout film.

13. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see.

14. Position the monitor for easy viewing by the radiologist. The room is now prepared for the lower GI exam.

Setting Up for an Intravenous Pyelogram (IVP)

The IVP uses a contrast media. This exam may cause an adverse reaction; therefore, the patient must sign an **informed consent form**, which explains the complications or adverse reactions that may occur from the contrast medium, before undergoing the exam. An example of an informed consent form is shown in Figure 2.4. If the patient refuses to sign, the radiology aide should contact the supervisor. If a further explanation of "adverse reactions" is required, ask the attending nurse, radiologist, or radiographer to provide the information. If the aide serves as the witness, he or she should sign the form in the appropriate place. Place the signed informed consent form with the requisition. Other than the need for a signed informed consent form,

Figure 2.4 - Example Informed Consent Form

DIAGNOSTIC RADIOLOGY CONTRASTED STUDIES INFORMED CONSENT

Your physician has ordered a/an _____ that is scheduled on _____ (date) in the Radiology Department. This is an examination of the _____ (anatomical region). You may be asked to prepare ahead of time for the exam by taking laxatives or following a specific diet.

This exam is performed frequently and can provide valuable diagnostic information. The procedure involves the injection of contrast media, which contains iodine, into a vein in your arm. This contrast media is the same as that used for kidney exams (IVP), angiograms, arteriograms, venograms and heart catheterization. If you have had any of these procedures, a similar contrast media was used.

Administration of contrast media does carry a small risk of allergic reaction. Minor reactions include rash, itching, and nausea. Such reactions usually respond readily to treatment.

Very rarely (less than 1 in 10,000) a serious and life-threatening reaction occurs. Most people who experience this type of complication respond well to treatment, although some do not and death has occurred from administration of contrast media (less than 1 in 50,000).

Your physician is aware of these risks and has determined that the diagnostic information obtained outweighs the risks.

IF YOU HAVE ANY QUESTIONS, PLEASE CONSULT YOUR PHYSICIAN.

I consent to the performance of this procedure, the administration of contrast media and pre-medication, and assume all risks in connection with the procedure indicated above.

_____ _____

Witness Patient's signature
(Parent or Guardian if child under 18)

Contrast Media _____ _____ _____

Date Time

Amount _____

By Whom _____

Appropriate Indication _____

_____

the preparation for the exam is the same as other procedures.

1. Prepare the patient and his or her records, then:

2. Lay the following items out in a neat and easily accessible order:

   - bottle(s) of contrast media,
   - one or two large syringes (50-60 ml),
   - one or two large-gauge needles,
   - one small-gauge needle for the injection,
   - alcohol prep pads (1-2),
   - tourniquet,
   - Band-Aid,™
   - one pair of disposable gloves,
   - one emesis basin,
   - four to five 14 x 17 in. regular cassettes, two to four 11 x 14 in. regular cassettes, and
   - two 10 x 12 in. regular cassettes

3. Place the patient's flash card in the ID camera, and flash one 14 x 17 in. cassette with the patient ID.

4. Assist patient into the radiographic room and onto the radiographic table.

5. Help the patient to assume the supine position for the A.P. scout film.

6. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see. The room is now prepared for the IVP.

Assisting the Radiographer to Position Patients for Radiographs

Positioning the patient for radiographic purposes is a precise and technical process. ***The radiographer decides upon the best position for the patient***. There are many specific positions for getting the best radiographs of various parts of the body. The radiology aide who is knowledgeable about projections and positions can help the radiographer achieve the best radiograph possible.

The patient may be debilitated and unable to assume the positions required. A patient may become stiff and sore as he or she lies on the table for an extended period of time. The radiology aide can then help the patient turn his or her body or body part to the approximate position required. A small child may be held in the required position with restraints. (See Figure 2.5.) Restraints are used only with a physician's order. Sometimes angle sponges and preformed cushions are used to help hold the patient in the best position. Sandbags are frequently used to immobilize a body part, such as the lower leg if the patient is unable to hold it in the desired position. Patients with casts or splints often cannot move about easily. The affected body part is usually very tender. The radiology aide can help the patient by supporting the affected body part and assist the radiographer by carefully moving the body part to the approximate position for the radiograph and by monitoring the placement of IV and oxygen tubing. Always be attentive to the patient's facial expressions, watching for signs of pain or discomfort during positioning. If patients

Figure 2.5 - Child Restraints as Positioning Aids

are uncomfortable during exams, offer reassurance and a source of distraction from their discomfort. A calm, cooperative patient will be able to help the radiographer get the best results from an exam.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 2: Assisting in the Radiographic Room

Activity Sheet

1. List the two ways radiographic film is classified.

   a.

   b.

2. List three common cassette sizes.

   a.

   b.

   c.

3. List two common cassette types and what they are used for.

   a.

   b.

4. Describe the general procedure for preparing patients for exams.

5. In which exam(s) is barium used?

6. What instructions should the aide use to determine the thickness of a barium mixture? How long should the mix be shaken after water is added?

7. How is the barium mixture for an upper GI exam given?

8. How is the barium mixture for a lower GI exam given?

9. What must the aide have the patient do before preparing for an IVP?

10. List two devices used to help hold patients in the best positions for radiographs.

    a.

    b.

Clinical/Laboratory Activities

1. At your clinical site identify as many types and sizes of radiographic film cassettes as are available. With the help of your clinical site supervisor, list what types of radiographs are taken at your clinical site.

2. If possible, help your supervisor or the radiographer at your site prepare a barium mixture for an upper GI. Under supervision, mix another solution to the same consistency.

3. Practice setting up for the procedures described in this lesson:

    Orthopedic exam
    Chest exam
    Upper GI exam
    Lower GI exam
    Intravenous pyelogram (IVP) exam

NOTE: If equipment is unavailable at your clinical site, substitute other articles and walk through the procedures.

4. Observe and/or assist with setting up as many of these types of exams as possible. Keep a log book of exams you have observed or assisted with throughout your clinical experience.

5. With your clinical supervisor's permission and supervision, use various positioning devices to support patients as they assume positions for various radiographic exams.

Lesson 3: Cleaning the Radiographic Room

Objectives:

A. Identify surfaces in the radiographic room that must be cleaned after each patient exam.

B. Clean radiographic room, observing body substance precautions.

C. Restock supplies and linens.

The radiology aide often serves as the health and welfare police force for the radiology department. Janitorial functions are very important in preventing the spread of disease among staff and patients. Systematic, thorough cleaning will help to ensure everyone's safety.

Surfaces to Be Cleaned after Exams

Any surface a patient touches should be cleaned after the exam is completed. These surfaces include but are not limited to:

Radiographic table - The tabletop and footboard are cleaned and disinfected after each patient's exam. The other parts of the table should be cleaned several times a day. When blood or body fluids (as with trauma patients) are involved, or after an episode of patient incontinence, the entire table must be thoroughly cleaned and disinfected.

Film cassettes - If a film cassette touches a patient, the outside (front and back) of the cassette should be cleaned and disinfected. The outsides of all cassettes should be cleaned on a routine basis (check individual department policy).

Wheelchairs - The seat, back, arms, and handles should be cleaned and disinfected after each patient transport and total cleaning done daily.

Stretchers - The mattress and top framework should be cleaned and disinfected after each patient transport and total cleaning done daily.

Cleaning the Radiographic Room

When cleaning, the aide should be aware of his or her own personal safety and that of others. Always wear disposable gloves. Often a disposable apron will be needed to avoid contaminating clothing. Every department uses a disinfectant solution to clean its equipment. The full-strength solution is usually diluted with water and placed in a spray bottle. This type of cleaner is very strong and can be caustic. If the product is transferred from its original container, a photocopy of the original label or a handwritten label identifying the product must be put on the second container. If cleaning for a long period of time or using a full-strength disinfectant, use heavy-duty industrial gloves. Before beginning any cleaning task, consult the MSDS to become familiar with the specific product(s) to be used.

Cleaning Methods

To clean a surface after patient contact, simply spray disinfectant on the area and wipe it off with a clean towel. Always point the spray nozzle away from your face and avoid inhaling the mist. Some departments require the radiology aide to wear goggles and a mask while performing cleanup. When cleaning heavily soiled areas or

using a large quantity of disinfectant, always wear goggles and a mask.

If blood or body fluid residues are present, soak the area with a germicide for the period of time indicated in the product instructions and then wipe the area dry. The time required for total disinfection will vary with different products, so always check the manufacturer's recommendation or ask your supervisor.

The toweling used to wipe up the germicide should be disposed of in a contaminated trash container or a contaminated linen bag. The contaminated trash or linen receptacles are clearly marked and are often colored red to distinguish them from regular trash containers. If the linen is to be reused, it must be disinfected before it is washed.

When the cleaning task is completed, remove your apron (if one was worn) and your gloves, place them in the contaminated trash receptacle, and wash your hands. In some instances it may be necessary to exchange soiled gloves for a fresh pair. As was noted in an earlier lesson, wash your hands between each glove change. If a single glove becomes torn or punctured, immediately dispose of that pair of gloves, wash your hands, and reglove.

Equipment and accessories that do not come in direct contact with the patient must also be cleaned on a regular basis. It is one of the radiology aide's responsibilities to know the cleaning schedule for each piece of equipment. He or she should read the department's policies and procedures manual. If the routine is not clear, ask the supervisor for clarification.

Restocking Supplies

The radiology aide is often asked to help keep the radiographic rooms adequately supplied with all items used on a regular basis. Since the aide assists in setting up rooms for examinations, he or she will be aware of which supplies are needed and which are adequately stocked. The following items are regularly stocked in most radiographic departments:

- Barium products for drinks and enemas,
- IV contrast media,
- Syringes and needles,
- Alcohol prep pads,
- Band-Aids™ and sterile and non-sterile gauze pads,
- Emesis basins, urinals, and bedpans,
- Gowns, sheets, pillowcases, and blankets,
- Disposable gloves and aprons,
- Cleaning linens (clean rags or towels), and
- Spray cleaners and disinfectants.

If unsure whether stock of a specific item is adequate, do not hesitate to ask your supervisor.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheet, you may complete the skill sheets and take the written unit evaluation. A score of 80 percent on the written exam indicates you have mastered this material and may proceed to the next unit.

Lesson 3: Cleaning the Radiographic Room

Activity Sheet

1. List four surfaces that must be cleaned after a patient has come in contact with them.

   1.

   2.

   c.

   d.

2. What should always be worn when cleaning?

3. When cleaning heavily soiled areas, what should you wear?

4. What should you use to clean areas where blood or body fluids are present?

5. What is done with the toweling used to clean up areas with blood or body fluids?

6. List the steps taken by a radiology aide after a cleaning task is completed.

   1.

   2.

   3.

7. List four items an aide might stock for a radiology department.

   a.

   b.

   c.

   d.

Clinical/Laboratory Activities

1. Take inventory of all the barium products and IV contrast media in a radiographic room. Make a list and put items in categories: sufficient, insufficient, and desperately low.

2. Ask your clinical supervisor what supplies are routinely stocked in that department and in what quantity. With the permission of the supervisor, restock the supplies in a radiographic room.

3. Make a list of cleaning supplies used at your clinical site. Are there any dangerous chemicals? Is there an MSDS available for each product? Are all cleaners and disinfectants clearly marked? Write a summary of your findings. Compare your findings with those of your classmates.

4. Ask your clinical supervisor to demonstrate how the surfaces are cleaned in the radiology department. With your supervisor's permission and supervision clean the radiographic room. Practice using BSP while cleaning an area contaminated, with blood and body fluids.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet: Introduction to Radiology Procedures Rating _____

Comments: _____

_____

Activity Sheet: Assisting in the Radiographic Room Rating _____

Comments: _____

_____

Skill Sheet: Prepare the Patient and His or Her Records Rating _____

Skill Sheet: Set up for an Orthopedic Exam Rating _____

Skill Sheet: Set up for a Chest Exam Rating _____

Skill Sheet: Set up for an Upper GI Exam Rating _____

Skill Sheet: Set up for a Lower GI Exam Rating _____

Skill Sheet: Set up for an Intravenenous Pyelogram (IVP) Rating _____

Activity Sheet: Cleaning the Radiographic Room Rating _____

Comments: _____

_____

Written Unit Evaluation Score _____

Additional Comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Unit V

Office Procedures

Depending on the size and organization of the radiology department, office tasks may be part of the radiology aide's primary responsibilities. Effective communication skills and attentiveness to detail are important when handling office procedures.

This unit will include tips and techniques for answering the telephone, scheduling appointments, and filing records and radiographs. While office procedures will vary among facilities, a working familiarity with basic office procedures will help the aide understand the overall patient processing system.

Unit Lessons

Telephone Techniques and Scheduling Appointments

Filing Procedures

Lesson 1:
Telephone Techniques and Scheduling Appointments

Objectives:

A. Answer phones and record messages.

B. Confirm appointments.

C. Schedule procedures.

Key Terms:

- Preps
- NPO

Large radiology departments may have receptionists and clerks who deal strictly with the business of running the office. But small departments often rely on the technologists, nursing staff, and radiology aides to answer phone calls, take messages, and schedule or confirm appointments. They may also handle other office tasks, such as faxing reports to physicians, checking out films to other facilities, and filling out information on radiographic reports and jackets.

Answering Phones and Recording Messages

When answering the phone, always use a pleasant tone, and confirm for the caller that he or she has reached the radiology department. The radiology aide should identify the clinic and give his or her own name. A concise way of answering the telephone would be to clearly and pleasantly say, "Radiology. This is Jane Smith."

Speak clearly and listen carefully to what the caller has to say. Do not ask a caller to hold unless it is absolutely necessary. If you must place a call on hold, inform the caller that you are doing so, and wait for him or her to respond. Do not place a call on hold until the caller agrees to wait.

A caller should not have to wait on hold longer than a few minutes. If the person to whom the caller wishes to speak cannot answer the phone right away, explain the situation to the caller. He or she may wish to wait a few minutes longer, call back later, or leave a message. Sometimes a staff member will return calls later rather than take them during a busy time of the day. When that is the case, indicate the latest time a call will be returned. If a return call cannot be guaranteed, do not mention it. For example, a salesperson may want to speak to the radiologist personally, but the doctor may feel no obligation to return such a call. You may simply tell such callers that the radiologist (or other staff member) is busy and ask them to call again later.

If the individual on the telephone is rude or demanding, remain calm and polite. The caller may respond well to your manner, and information can then be exchanged. If the caller becomes verbally abusive, get his or her name and phone number and ask, "May I have my supervisor call you back?" Immediately inform your supervisor of the situation so that he or she can be prepared to make the return call.

Never argue with a patient. Always remember that the patient may not be angry with you but with the situation. Other circumstances may be contributing to his or her anger. Do not allow a lack of courtesy and tact on the part of a client to affect your professionalism.

Part of professional office behavior is using good grammar during business calls. Be careful of using the sort of slang you might use in casual conversation. Keep in mind that it is more difficult to understand speech over the phone than in person.

If the caller asks about a patient, the radiology aide may indicate whether or not the patient is in the department, but other information about the patient should not be provided. Calls regarding patients must be referred to the patient's physician, the radiologist, or the radiographer.

Keep in mind the following techniques for handling phone calls:

- Answer the telephone promptly.
- Identify the department and yourself in your greeting.
- Speak slowly and clearly.
- Keep a pen or pencil and a message pad next to the phone.
- Be a good listener. Let callers explain their purpose. Don't hurry them.
- Establish the nature of the call and be prepared to make note of names, times, and phone numbers.
- Do not be afraid to ask a caller to spell a word or name or to repeat a phone number.
- Record messages carefully. Include the date and time of the call, the subject of the call, the caller's name, address or affiliation, and the phone number with area code. Repeat the phone number back to the caller for confirmation. Note the person for whom the message is intended and sign your name or initials.
- Make every effort to relay a message promptly. If the appropriate person is unavailable, and you must leave a message in a mailbox, check back later to be sure the message was received.
- If unsure about how to answer a caller's question, direct the call to someone who can help.
- Follow through on any promises to fax a record or return a call.
- If calling to confirm an appointment, do not leave details about the examination on an answering machine or with a person other than the patient. Keep the patient's right to confidentiality in mind.
- Practice tact when cutting a conversation short or asking a caller to hold.

Confirming Appointments

In large radiology departments, there may be a member of the office staff who schedules and confirms appointments. In a small department, it may be the radiology aide who confirms appointments and calls to remind patients of their appointments. It is most important to correctly inform the patient of the day and time of the examination. Schedules may be handwritten or typed onto a computer. Software applications for scheduling vary. If the appointment schedule is kept on computer, the aide should ask his or her supervisor to explain the specific scheduling program used.

Figure 1.1 - Prep Sheet for Lower GI Exam

Dear Mr. Hardy
(patient name)

Your physician, Dr. Shapiro has ordered an (a)

Lower GI for you. This is an x-ray examination
(specific type of exam)

of your large intestine.

The exam is scheduled for 8:00 a.m., 26 January 1998.
(time, day, month, year)

Sunday evening you may eat what you like for dinner (evening meal).

Do not eat or drink anything after midnight. Report to the scheduling desk

(or x-ray department) at 7:30 a.m. 26 January 1998.
(day, month, year).

Scheduling Procedures

A radiology aide who is familiar with scheduling procedures can be an asset to the department. As mentioned above with appointments, details (patient's name, phone number, type of examination, any preparation) may be noted in a computer file or on paper.

The aide should keep certain information in mind when scheduling exams. The aide must have a knowledge of the required preparations, or **preps,** for all exams. For example, some exams, like fluoroscopic exams, require the patient to fast prior to the study. That would be indicated by **NPO**, an abbreviation that comes from the Latin term meaning "nothing by mouth," on the record. Exams requiring fasting are often done early in the morning. When scheduling such an exam, be sure the patient understands what he or she must do to prepare for the exam. Prepare a prep sheet for the patient and hand it out when scheduling the exam. Figure 1.1 shows a sample prep sheet. If scheduling the exam over the phone, read the information to the patient and ask him or her to repeat it back to you. If a patient requests an explanation of an examination, ask your supervisor or the radiologist to explain the procedure.

Also remember that some examinations may be performed by the radiologist with assistance from the radiographer. Examinations requiring more than one staff member must be scheduled with their availability in mind. It is often necessary for the radiology aide to keep many staff members' schedules in mind. The proper scheduling of examinations is crucial to the smooth running of the radiology

Figure 1.2 - Radiology Room Schedule

Exam Schedule Monday, January 12, 1998 R/F Rooms #1 and #2

Day shift Radiologist: Dr. McKinney

A.M.	7:00	Barium enema: Ema White (rm. 1)
	7:15	
	7:30	Upper GI: Gregory Gunn (rm. 2)
	7:45	Upper GI: Sam Smith (rm. 1)
	8:00	IVP: Dan Drew (rm. 2)
	8:15	
	8:30	Barium enema: Nancy Que (rm. 1)
	8:45	
	9:00	P.A. and Lat. chest: Susan Small (rm. 2)
	9:15	Morning break (if possible)
	9:30	Emergency room (ER) duties
	9:45	
	10:00	ER
	10:15	
	10:30	
	10:45	ER
	11:00	
	11:15	ER
	11:30	
	11:45	
P.M.	12:00	Lunch break
	12:15	
	12:30	
	12:45	A.P. and upright abdomen: Brenda Bush (rm. 1)
	1:00	P.A. and Lat. chest: Howard Worth (rm. 1)
	1:15	
	1:30	A.P. and Lat. chest: Carol Snow (patient in wheelchair) (rm. 2)
	1:45	C-spine (cervical spine, neck) follow up: John Martin (rm. 1)
	2:00	L-spine (lumbar spine, lumbosacral spine): Keith May (rm. 1)
	2:15	A.P. or P.A. and Rt. Lat. decubitus chest: Martha Swan (rm. 2)
	2:30	Afternoon break (if possible)
	2:45	Pelvis and right hip: Jim Smith (rm. 2)
	3:00	P.A. and Lat. chest: Cindy Jones (rm. 1)
	3:15	P.A. and Lat. chest: Mark Mills (rm. 2)
	3:30	

department. Figure 1.2 shows a sample schedule.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

Lesson 1: Telephone Techniques and Scheduling Appointments

Activity Sheet

1. List five telephone techniques the radiology aide should use.

   a.

   b.

   c.

   d.

   e.

2. How should the aide respond to an abusive caller?

3. List two things the aide should remind a patient of when confirming an appointment.

   a.

   b.

4. When scheduling an exam that requires preparation on the part of the patient, what may you give the patient as a reminder?

5. Who should answer the patient's questions about the actual examination?

6. Fill out a prep sheet for a patient who is having an upper GI. Make up your own name, date, and time. Remember that it is preferable to schedule this type of exam early in the morning.

Dear _____
(patient name)

Your physician, Dr. _____, has ordered a(n)

_____for you. This is an x-ray examination
(specific type of exam)

of your stomach and esophagus (a tube that runs from your throat to your stomach).

The exam is scheduled for _____.
(time, day, month, year)

_____ evening you may eat what you like for the evening meal.
(day of the week)

Do not eat or drink anything after midnight. Report to the scheduling desk

(or radiology department) at _____ a.m. _____.
(day, month, year)

7. Fill out a morning x-ray schedule for radiology rooms 1 and 2. Allow 30 minutes for barium enemas and IVPs and at least 15 minutes for upper GIs. Fit radiographs in around these procedures. Begin at 7:00 a.m. Your radiologist must leave for a meeting at 10:30 a.m. and will be gone until after lunch. The workload for the morning is 2 barium enemas, 2 upper GIs, 2 IVPs, and 3 chest x-rays.

Exam Schedule - Monday, July 15, year R/F Room # 1 and # 2

Day Shift Radiologist: Dr. McKinney

A.M.	7:00
	7:15
	7:30
	7:45
	8:00
	8:15
	8:30
	8:45
	9:00
	9:15
	9:30
	9:45
	10:00
	10:15
	10:30
	10:45
	11:00
	11:15
	11:30
	11:45

8. Prepare messages using the information provided in the scenarios below.

   a. Dr. Jones from Family Health Clinic called at 6:30 p.m., Monday, June 1, regarding her patient, Hattie Dunn, who is scheduled for a C.T. scan of the head on June 4. Dr. Jones insists the patient be scheduled sooner than June 4 due to her condition. Dr. Jones wants to be notified of the new date and time ASAP. Dr. Jones wants Jeremy Smith, the receptionist, to phone him at 797-3124.

   b. Mr. James Wilson called at 7:00 a.m. today, May 24. Mr. Wilson does not understand why he cannot eat what he wants for lunch today, "just because he's having some test done tomorrow that he doesn't need anyway." He wants the supervisor to call him before 10:00 a.m. today at 994-3636.

TO: _____

DATE _____ TIME _____

BY: _____

☐ Please return call ☐ Telephoned

☐ Will call again ☐ Returned your call

Name of caller: _____

of: _____

Phone: _____

Message: _____

_____

_____

_____

TO: _____

DATE _____ TIME _____

BY: _____

☐ Please return call ☐ Telephoned

☐ Will call again ☐ Returned your call

Name of caller: _____

of: _____

Phone: _____

Message: _____

_____

_____

_____

Clinical/Laboratory Activities

1. Does the office at your clinical site schedule appointments by computer or manually? Is there a centralized "post office" for notes and incoming mail? Is there a bulletin board? Write a summary of your findings, and discuss them with your classroom instructor and classmates.

2. With the approval of your clinical supervisor, help the receptionist answer the phone and take messages. Remember to find out how the facility wants the phone to be answered.

3. With the approval of your clinical supervisor, call patients to confirm upcoming appointments and to schedule procedures.

Lesson 2:
Filing Procedures

Objectives:

A. Identify common filing systems.

B. File radiographs accurately.

Key Terms:

- Alphanumeric
- Color/bar code

It is very important that specific patient records and radiographs be in the appropriate files so that they can be retrieved as needed. The radiology aide should be familiar with the most common filing systems as well as the system in operation in his or her department.

Common Filing Systems

There are several different methods of filing x-ray envelopes. Some very small facilities file alphabetically or by patient ID number, birth date, or social security number. Such systems are unworkable in large settings because of the potential for confusion. In large settings, the two more commonly used methods of filing are the alphanumeric and color/bar code systems. In both systems, patients' names are cross-referenced to their file codes. Some hospitals use card files, and others use computerized systems to maintain cross-reference databases.

Alphanumeric

To make finding files as simple as possible, the **alphanumeric** system uses either a set of coded numbers or numbers and letters before or after the patient identification number. For example, a file might be labeled 95-1234, 1234-95, AB-1234, or 1234-AB. The first patient's file would be 95-01 or AB-01.

Some departments allow each patient to keep the same identification number, and only the prefix or suffix changes from year to year. Other facilities assign patients new numbers each year. In that case, on January 1, the first patient of the year is assigned 95-01 (or AB-01) and will keep that number for the entire year. If the patient already has an x-ray file at the facility, it is pulled, the new number is affixed to the envelope, and the most recent radiographs are added to the folder. Usually the most recent radiographs are placed at the front of the envelope. Great care must be taken to ensure the correct prefix or suffix and numbering sequence are used to prevent radiographic files from being lost or misplaced.

Color/Bar Code

With the **color/bar code** system, departments either attach colored tape to radiographic envelopes or use envelopes that come with the colored bars preprinted on them. Patients again have numbers and are assigned to certain color groups as well. Sequences vary, but often the color changes every 100 numbers. This system is very effective, especially in larger facilities that must process and maintain a huge volume of films. With color/bar coding, envelopes filed out of sequence outside their color group are easily recognized. Films filed out of sequence within the proper color require personnel to search only a relatively few files to find the misplaced one.

Filing Radiographs Accurately

In the radiology department, as in departments throughout the hospital, files must be easily accessible. Active patient files are frequently retrieved and reviewed, and new information is added to them. Personnel from other facilities may request radiographs for comparison with new films.

Old, inactive files are important too. The laws for retention of radiographs vary from state to state. A general requirement is that radiographic records of adult patients be retained by the facility for five to seven years after the date of the last examination. Radiographs of minor patients must often be kept for two years after the patient has legally become an adult, provided he or she has not been radiographed within a five- to seven-year period. If he or she has, all films are kept the same length of time as adults' records.

These requirements obviously impose serious record-keeping responsibilities on medical facilities. Even small institutions need quite a lot of storage space. Many facilities store films off-site. Those keeping records in-house may microfilm the examinations so that the size of the records is greatly diminished or digitize the radiographs and store them on computer disks. Whatever method is used, accuracy is crucial. This is why proper filing and record keeping are continually stressed in the radiology department.

Most facilities keep films from the current year and possibly films from the last two or three years within easy access. These films are those of patients who are likely to visit the facilities again. Many departments keep the most recent files separate (in a three-day or one-week file), so that physicians can easily review the newest films and exam results of current patients.

Test Your Knowledge: Complete the following activity sheet to test your knowledge and understanding of the materials you have studied in this lesson.

After you have completed the activity sheet, you may complete the skill sheets and take the written unit evaluation. A score of 80% on the written exam indicates you have mastered this material and may proceed to the next unit.

Lesson 2: Filing Procedures

Activity Sheet

1. List two common filing systems used in radiology departments.

   a.

   b.

2. Why won't filing systems using patients' names or social security numbers work in large facilities?

3. What are two advantages of color/bar coding?

4. List two long-term storage methods facilities may use to reduce the size of stored radiographs.

   a.

   b.

5. How long may a facility be required to retain an adult patient's radiographs?

6 How long may a facility be required to retain a minor patient's radiographs?

7. List two reasons you might need to retrieve a patient's file from storage.

   a.

   b.

Clinical/Laboratory Activities

1. With the permission of your supervisor, check the filing system used in your clinical site. If possible, assist with filing patient radiographs.

2. Records are constantly accessed in the radiology department. List the steps of your interaction with patients while in your clinical site, from making the initial appointment to filing the radiograph. Note the many times you handle various patients' records. Be sure to include how the appointment was made, the admission process, radiographic room record keeping, and filing. If there are many types of patients, for example, inpatients, outpatients, and emergency room patients, you may want to make several lists. If possible, compare your list with a classmate's and discuss any differences in the systems used.

Unit Checklist

Student Name _____ Overall Unit Rating _____

Activity Sheet: Telephone Techniques and Scheduling Appointments Rating _____

Comments: _____

_____

Activity Sheet: Filing Procedures Rating _____

Comments: _____

_____

Written Unit Evaluation Score _____

Additional Comments: _____

_____

_____

Teacher Signature _____ Date _____

Student Signature _____ Date _____

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. Which of the following kinds of radiation is used to diagnose and treat injury or disease?

   a. Alpha radiation
   b. Gamma radiation
   c. Ultraviolet radiation
   d. Beta radiation

2. What is an x-ray?

   a. Permanent film record of an examination
   b. High-frequency sound wave
   c. Beam that passes through the body to create an image
   d. Radio wave

3. Who normally takes the radiographs?

   a. Radiologist
   b. Radiographer
   c. Radiation therapist
   d. Radiology aide

4. Who reads and interprets radiographs?

   a. Radiologist
   b. Radiographer
   c. Radiation therapist
   d. Radiology aide

5. Who normally transports patients and sets up for exams?

   a. Radiologist
   b. Radiographer
   c. Radiation therapist
   d. Radiology aide

6. What duty should be the major focus of a radiology aide?

   a. Observing the radiographer's actions
   b. Providing quality patient care
   c. Identifying specific equipment
   d. Studying the operations manual

7. Which of the following is an illegal action?

   a. Discussing of a patient's illness with someone not directly involved
   b. Taking short cuts in patient care because of a patient's illness
   c. Altering a patient's medical record
   d. Leaving patients to wait without explanation

8. Which of the following is an unethical action?

   a. Taking supplies to use at home
   b. Performing an IV contrast exam on a patient without his or her consent
   c. Performing a radiographic exam without a physician's order
   d. Working outside the scope of your training and experience

9. If a slight injury occurs to a patient, and the radiology aide is in the area, the aide should:

   a. Fill out and turn in an incident report.
   b. Leave the patient and go get the radiologist.
   c. Page the patient's physician.
   d. Give first aid, but do not report the incident.

10. If a patient's relatives asks about the patient's diagnosis, the radiology aide should:

    a. Give them the information.
    b. Tell them to ask the patient.
    c. Refer them to the patient's physician.
    d. Send them to the record room with a permission slip to see the file.

11. Empathy means:

    a. Never having to say you are sorry.
    b. Feeling sorry for the patient.
    c. Putting yourself in the patient's place.
    d. Taking over if the radiographer is not there.

12. What should an aide do when greeting patients?

    a. Speak clearly at a comfortable volume.
    b Maintain a sober, dignified expression.
    c. Always stay behind the reception desk.
    d. Tell patients they will be seen immediately.

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13. Examinations of the pediatric patient can be done:

    a. Only in the presence of the parent.
    b. Only by the radiologist.
    c. By the radiology aide.
    d. With or without the parent(s) in the room.

14. When caring for a confused patient, the radiology aide:

    a. Should use restraints.
    b. Should leave the patient alone only for a short period of time.
    c. Should never leave the patient alone.
    d. Should administer a mild sedative to keep the patient calm.

15. When communicating with a pediatric patient, the radiology aide should:

    a. Always stand straight to maintain authority.
    b. Always keep one hand on the child.
    c. Talk to the parents only.
    d. Sit down next to the child and make eye contact.

16. When assisting a geriatric patient, the radiology aide should:

    a. Speak loudly, most geriatric patients have hearing loss.
    b. Ask the patient to remove his or her glasses (if he or she wears them) for the exam.
    c. Offer assistance only when needed.
    d. Immediately get a stretcher to transport the patient.

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. Which of the following is not true of crossover rollers?

   a. They grab the film and move it from one area of the processor to the next.
   b. They should be cleaned every day.
   c. They may be removed from the processor for cleaning and then replaced wherever they fit.
   d. Chemicals may be present on them.

2. When should crossover rollers be cleaned?

   1. In the morning before the processor is started
   2. Any time of day is sufficient
   3. In the evening before shutting down
   4. Once a week

3. Unwanted marks, densities, and blurred areas that occur on radiographs during processing are usually caused by:

   a. Shaking the processor.
   b. Poor-quality film.
   c. Inaccurate timing of film processing.
   d. Static electricity discharges.

4. Which of the sequences listed below show the path of a radiograph through the processor?

   a. Developer, water bath, fixer, dryer
   b. Developer, fixer, water bath, dryer
   c. Water bath, developer, fixer, dryer
   d. Water bath, fixer, developer, dryer

5. When checking darkroom integrity, which of the following places does not need to be checked?

   a. Spaces around the door
   b. Spaces around the processor
   c. Spaces around the safelights
   d. Spaces around the film bin

6. How often should you restock film?

   a. Every time you check darkroom integrity
   b. Whenever you have to wait for film to process
   c. Once a week
   d. Twice a day

7. What pulls the radiograph into the processor?

   a. Crossover rollers
   b. Feed tray
   c. Entry rollers
   d. Developer rollers

8. Which tank holds fresh chemicals for the processor?

   a. Developer tank
   b. Fixer tank
   c. Wash tank
   d. Replenishing tank

9. Why is it important to wipe the feed tray?

   a. Eliminate static electricity
   b. Polish the feed tray
   c. Help the darkroom look clean
   d. Make the film slide more easily across it

10. What does chemical residue on the third cleanup film indicate?

    a. The chemicals are good.
    b. The chemicals are bad.
    c. The processor needs a thorough cleaning.
    d. Another cleanup film should be run.

11. Why should you wash and dry your hands before handling film?

    a. You may drop film if your hands are not clean.
    b. You may leave artifacts on the radiograph.
    c. Radiographs are sources of contamination.
    d. Washing and drying your hands is a good habit.

12. When working with processor chemicals, you should:

    a. Take no special precautions.
    b. Wear an apron, gloves, and eyewear.
    c. Wear good clothes.
    d. Wear gloves only if contact with the chemicals is possible.

13. What is the name of the process in which patient information is photographically placed on a radiograph?

    a. Marking
    b. Noting
    c. Flashing
    d. Matching

14. When removing film for a cassette, you should:

    a. Lift one side with your fingernails and flip the film out.
    b. Tip the cassette to let the film drop out.
    c. Grasp the film firmly in the center with your thumb and forefinger.
    d. Grasp one corner of the film firmly with your thumb and forefinger.

15. Which piece of information is NOT flashed on a radiograph?

    a. The patient's name
    b. The patient's age
    c. The date of the exam
    d. The patient's phone number

16. Which machine automatically unloads cassettes, runs films, and reloads cassettes?

    a. Multiloader
    b. Processor
    c. Film bin
    d. Autoloader

17. What should you use to clean the intensifying screens?

    a. Detergent and a soft cloth
    b. Screen-cleaning solution and a lint-free cloth
    c. Spray-on glass cleaner and a paper towel
    d. A soft, lint-free cloth

Lesson 1: Preparing the Darkroom

Skill Sheet

PREPARE THE PROCESSOR FOR OPERATION

Student Name _____ Date _____

EQUIPMENT:

1. Rubber gloves
2. Eye protection
3. Plastic apron
4. Processor
5. Chemicals for replenishing tanks
6. Clean cloth for crossover rollers
7. Clean cloth for feed tray and feed table
8. Cleanup film
9. Clean cloth for work surfaces

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Put on gloves, eye protection, and apron.		
2. Remove top and sides of processor.		
3. With processor off, remove the sets of crossover rollers from the machine. As you take them out, put them down on the counter in order so that you will know which set of rollers is which.		
4. While the top is off and the crossover rollers out, inspect the levels of chemicals in the tanks. If either level is low, add some fresh chemicals from the appropriate replenishing tank.		
5. Clean the rollers in running water, and wipe them with a clean cloth. Replace them in the processor.		
6. Wipe down the feed tray, or feed table, with a clean, damp cloth before start-up to remove any particles of dust or other matter that could be picked up by a piece of film.		
7. After the crossover rollers and feed tray have been cleaned, visually inspect the replenishing tanks. If the levels are low (generally fewer than five gallons), solution should be added to the tanks.		
8. Before replacing the lid on the processing section, turn the processor on and verify that the recirculation pumps are operating.		

9. If the recirculation pumps are functioning, replace the lid on the processor. Allow the processor time to warm up.		
10. Run cleanup film. a. Be sure the white lights are off. Take a piece of 14 x 17 film from the film bin.		
b. Close the film bin and expose the film briefly to white light.		
c. Place the film on the feed tray and push it gently into the processor until you feel the entry rollers grab the film and begin pulling it in. **Caution:** Do not pull the film out of the dryer. Wait until it drops out on its own.		
d. After the film leaves the processor, inspect both sides of the film. Look for scratches and dried chemical residue.		
e. If there is chemical residue on the film, run another cleanup film.		
f. Run cleanup film up to three times. If, after the third time, there is still chemical residue on the film, the rollers in the processor are quite dirty, and the machine requires extensive cleaning. Notify your supervisor.		
11. Before leaving the darkroom, wipe a clean, damp cloth over all work surfaces.		

The student has satisfactorily completed the procedure "PREPARE THE PROCESSOR FOR OPERATION" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 1: Preparing the Darkroom

Skill Sheet

MAINTAIN DARKROOM INTEGRITY

Student Name _____ Date _____

EQUIPMENT:

Duct tape

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Close the darkroom door.		
2. Turn off the safelights, lights that have a red filter and will not damage unexposed film, so that the room is completely dark.		
3. Allow your eyes time to adjust to the dark, and then look around the edges of the door, the pass boxes, and the processor to make certain there are no light leaks.		
4. If white light is visible anywhere, repair the leak immediately. Seal the leak with a strip of duct tape as a simple, temporary solution.		
5. Turn the safelights on and check around their edges for white light.		
6. Report any light leaks to your supervisor so that maintenance can be notified and the problem corrected.		

The student has satisfactorily completed the procedure "MAINTAIN DARKROOM INTEGRITY" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Processing Radiographs

Skill Sheet

FLASH WITH IDENTIFICATION PRINTER

Student Name _____ Date _____

EQUIPMENT:

1. Cassette
2. Film
3. Flash card
4. Identification printer

Note: This sheet is to be used in departments using identification printers.

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Inside the darkroom, remove the film from the cassette. Open the cassette as though it were a book. Reach in and grasp a corner of the film with your thumb and forefinger.		
2. Place the flash card in the top slot of the printer.		
3. Place the corner of the film that was under the window of the cassette in the bottom of the printer.		
4. When both the flash card and the film are in place, firmly press down on the top of the printer. This will activate a light and photograph the card on the film. An indicator light will flash to show that the printer is operating. If the indicator light does not come on, check the film after it comes out of the processor. If the film is flashed, the indicator light on the printer is probably burned out, and the printer may still be used. If the film is not flashed, the light used to create the image in the printer is burned out. In either case, notify the supervisor of the problem.		

The student has satisfactorily completed the procedure "FLASH WITH IDENTIFICATION PRINTER" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Processing Radiographs

Skill Sheet

FLASH WITH IDENTIFICATION CAMERA

Student Name _____ Date _____

EQUIPMENT:

1. Cassette
2. Film
3. Flash card
4. Identification camera

Note: This sheet is to be used in departments using identification cameras.

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Slide the flash card with the printed side down into the slot on top of the camera.		
2. On the back of the cassette is a metal slide called a window. Place the cassette with the window facing up into the bottom slot of the camera. The camera will open the window, expose the film, and then close the window.		
3. Watch for a light on the top of the camera to come on, indicating that the camera is operating properly.		
4. Remove the cassette.		

The student has satisfactorily completed the procedure "FLASH WITH IDENTIFICATION CAMERA" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. Which of the following is not a potential radiographic room hazard?

   a. Radiation exposure
   b. Electrical shock
   c. Exposure to infection
   d. Excessive noise

2. Which of the following practices is not used to prevent the spread of infection?

   a. Handwashing
   b. Avoiding any physical contact with patients
   c. Using Body Substance Precautions (BSP)
   d. Using personal protective equipment

3. When should you wash your hands?

   a. Before and after contact with a patient
   b. Before donning and after removing gloves
   c. Before and after eating or smoking
   d. All of the above

4. When handling geriatric patients, the radiology aide should:

   a. Make sure their skin is protected.
   b. Give patients canes to lean on.
   c. Treat them just like other patients.
   d. Slide them whenever possible.

5. Which of the following is not considered personal protective equipment?

   a. Gowns or aprons
   b. Masks
   c. Gait belts
   d. Eyewear

6. Which of the following is not a sign of an infiltrated IV?

   a. Patient complains of pain around the insertion point of the needle.
   b. Skin around the area appears swollen.
   c. A bruise is present.
   d. Skin is wet.

7. An IV pump alarm will sound when:

   a. There is a blockage in the tubing.
   b. The patient leaves his or her bed.
   c. The patient cannot absorb any more fluid.
   d. The patient signals for assistance.

8. Moving a patient from a bed to a wheelchair is an example of:

   a. Transferring.
   b. Transporting.
   c. Lifting.
   d. Supporting.

9. Moving a patient from his or her room to the radiology department is an example of:

   a. Transferring.
   b. Transporting.
   c. Admitting.
   d. Ambulating.

10. A sheet of heavy material placed under the patient from the shoulders to the knees is called a:

    a. Bed pad.
    b. Cover sheet.
    c. Transfer sheet.
    d. Bedspread.

11. When transferring a patient from a stretcher to an examination table with a partner:

    a. The stretcher should be lower than the table.
    b. It is not necessary to lock the wheels of the stretcher.
    c. Jerk the patient over quickly and firmly.
    d. Make the move on the count of three.

12. Which of the following is <u>not</u> a type of transfer?

    a. Stand and pivot transfer
    b. Turn and roll transfer
    c. Sliding board transfer
    d. Swing transfer

13. When a patient is completely dependent, he or she is transferred using a(n):

    a. Passive-assisted transfer
    b. Active-assisted transfer
    c. Three-person transfer
    d. Sliding board transfer

14. During transfer, why must lines, tubes, and bags be carefully observed?

    a. Their fluid levels must be monitored constantly.
    b. They interfere with radiographs.
    c. They are sources of infection.
    d. They can become tangled around the patient or around x-ray equipment.

15. When may a patient's backboard be removed?

    a. When it is necessary to get a better radiograph.
    b. When the patient complains of discomfort from the backboard.
    c. When a physician orders the board removed.
    d. When emergency room personnel need the board.

16. When transporting a patient on oxygen therapy, who should transfer the oxygen?

    a. Radiology aide
    b. Physician
    c. Nurse
    d. Physical therapist

17. Which of the following is not a mode of transport?

    a. Stretcher
    b. Elevator
    c. Ambulation
    d. Wheelchair

18. When transferring a patient from a wheelchair to the radiographic table and back, which side should the radiology aide stand on?

    a. Patient's weak side
    b. Patient's strong side
    c. Patient's right side
    d. Patient's left side

19. After taking a patient to the bathroom, when should you check on the patient?

    a. In 5 minutes
    b. In 10 minutes
    c. In 15 minutes
    d. It is an intrusion to check a patient in the bathroom until he or she calls you.

20. When must you wear gloves?

    a. When assisting a patient to and from the bathroom
    b. When handing a patient a urinal
    c. When assisting a patient with a bedpan
    d. When transporting a patient with a catheter

21. A tube placed within the bladder through the urethra is called a:

    a. Drain.
    b. Urine tube.
    c. Urinary catheter.
    d. Urethral tube.

22. Which of the following is <u>not</u> one of the radiology aide's primary goals in an emergency?

    a. To preserve the patient's life
    b. To keep careful records
    c. To prevent further problems
    d. To get proper medical help as soon as possible

23. Which of the following is a cause of respiratory arrest?

    a. Localized area of swelling in the upper respiratory tract
    b. Failure of the central nervous system
    c. Choking on an object or a piece of food
    d. All of the above.

24. Which of the following is a sign of respiratory arrest?

    a. Beds of the fingernails look blue.
    b. Patient takes short, panting breaths.
    c. Patient suddenly becomes calm.
    d. All of the above.

25. Cardiac arrest is a term used to describe:

    a. A blockage of one of the cardiac arteries.
    b. A sharp pain in the chest.
    c. Stopping of the heart.
    d. Loss of consciousness.

26. The method of clearing a piece of food or foreign object from the throat of a choking person is called the:

    a. Abdominal jerk.
    b. Heimlich maneuver.
    c. CPR.
    d. Bear hug.

27. When a patient is having a seizure, you should:

    a. Hold the patient down.
    b. Use a pencil to hold the patient's tongue in place.
    c. Give the patient a sedative.
    d. Place padding under the patient's head.

28. Which of the following actions should the radiology aide take if the patient begins to vomit?

    a. Instruct the patient to take short breaths through the mouth.
    b. Roll the patient onto his or her right side.
    c. Place a cool washcloth on the patient's forehead.
    d. Place an alcohol pad under the patient's nose.

Lesson 2: Assisting Patients with IVs

Skill Sheet

GOWN IV THERAPY PATIENTS

Student Name _____ Date _____

EQUIPMENT:

1. Pajama top
2. Sheet
3. Hospital gown
4. IV tubing and tape

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Make certain there is plenty of slack in the IV tubing.		
2. Instruct the patient to slide the arm with the IV out of the sleeve, being careful that the needle does not get caught on the material. Always try to maintain the modesty of the patient. Have a sheet ready to cover the patient as he or she is disrobing.		
3. When the arm is free of the sleeve, slide the IV bag up the sleeve and out of the shirt.		
4. Pull the remainder of the tubing through the sleeve.		
5. Once the side of the garment with the IV is off, have the patient slip out of the other side as he or she would normally remove the garment.		
6. Take the IV bag and slide it through the sleeve of the gown from the inside to the outside.		
7. Pull the tubing through the sleeve.		
8. Have the patient place the arm with the IV needle through the opening, being careful not to catch the needle on the sleeve.		
9. Once the arm with the IV is through, it is a simple matter to have the patient put the free arm through the other sleeve.		
10. Tie the gown for the patient.		

The student has satisfactorily completed the procedure "GOWN IV THERAPY PATIENTS" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

17.

Lesson 3: Transferring and Transporting Patients

Skill Sheet

STAND AND PIVOT TRANSFER (ACTIVE-ASSISTED)

Student Name _____ Date _____

EQUIPMENT:

1. Hospital bed
2. Socks
3. Nonslide shoe
4. Wheelchair
5. Bath blanket or protective pad
6. Gait belt
7. Pillow

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash your hands.		
2. Assemble necessary equipment.		
3. Identify and greet patient. Identify self.		
4. Explain what you are going to do.		
5. Provide privacy.		
6. If at bedside, adjust bed height to low position. Lock brakes of bed.		
7. Assist patient to move to within five or six inches of the edge of the bed/table.		
8. Assist in putting on socks and nonskid shoes.		
9. Position wheelchair on patient's strong side if indicated; if not, position wheelchair as desired.		
10. Place wheelchair parallel to or at a 45° angle to the bed/table.		
11. Lock the wheels of the wheelchair.		
12. Cover wheelchair with bath blanket and/or protective pad. Raise footplates and remove if possible. Remove the armrest on the side next to the bed/table.		
13. Assist the patient to sit up. a. Prepare to follow principles of good body mechanics for lifting.		

b. Put one forearm under patient's shoulders and the other behind the knees.		
c. Bend your knees, keep your back straight, and stand with feet about 18 inches apart.		
d. Straighten your hips and knees while shifting weight from front foot to back foot. At the same time, lift patient's head/neck with one arm while pulling the legs over the side of bed with other arm.		
14. Apply gait belt.		
15. Allow the patient time to adjust to being in a sitting position before you proceed. Assist the patient in maintaining a sitting position as needed.		
16. Place hands underneath belt along the patient's side with palms up.		
17. Instruct patient to stand on the count of three.		
18. Assist patient to stand and support the weak leg with your knee, if indicated.		
19. Instruct patient to reach with his or her strong hand and grasp for the far armrest of the chair.		
20. Assist the patient to pivot toward his or her strong leg by turning your own body. Do not twist; turn your body as a unit.		
21. Gently assist patient to sit by bending your knees while keeping back straight.		
22. Replace wheelchair parts and make sure they are secure.		
23. Help patient move back in wheelchair, straighten the seat cushion and patient's clothing, and fasten seat belt.		
24. Position the weak arm and leg properly on the armrest and footplate. A pillow may be used to support the weak arm.		
25. Wash your hands.		

The student has satisfactorily completed the procedure "STAND AND PIVOT TRANSFER (ACTIVE-ASSISTED)" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) _____ Date _____

Lesson 3: Transferring and Transporting Patients

Skill Sheet

STAND AND PIVOT TRANSFER (PASSIVE-ASSISTED)

Student Name _____ Date _____

EQUIPMENT:

1. Hospital bed
2. Wheelchair
3. Socks
4. Nonskid shoes
5. Bath blanket or protective pad
6. Gait belt
7. Lap robe
8. Pillow(s)

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash your hands.		
2. Assemble necessary equipment.		
3. Identify and greet patient. Identify self.		
4. Explain what you are going to do.		
5. Provide privacy.		
6. If at bedside, adjust bed height to low position. Lock brakes of bed.		
7. Assist patient to move to within five or six inches of the edge of the bed/table		
8. Assist in putting on socks and nonskid shoes.		
9. Position wheelchair on patient's strong side if indicated; if not, position wheelchair as desired.		
10. Place wheelchair parallel to or at a 45° angle to the bed/table.		
11. Lock the wheels of the wheelchair.		
12. Cover wheelchair with bath blanket and/or protective pad. Raise footplates and remove if possible. Remove the armrest on the side next to the bed/table.		
13. Assist the patient to sit up. a. Prepare to follow principles of good body mechanics for lifting.		

b. Put one forearm under patient's shoulders and the other behind the knees.		
c. Bend your knees, keep your back straight, and stand with feet about 18 inches apart.		
d. Straighten your hips and knees while shifting weight from front foot to back foot. At the same time, lift patient's head/neck with one arm while pulling the legs over the side of bed with other arm.		
14. Apply gait belt.		
15. Allow the patient time to adjust to being in a sitting position before you proceed. Assist the patient in maintaining a sitting position as needed.		
16. Stand directly in front of the patient, grasp the back of the belt.		
17. Support the patient's knees and feet with your knees and feet, either knee-to-knee or your knees on the sides of the patient's knees, whatever is comfortable for you and the patient.		
18. Have the patient lean forward while sitting on the edge of the bed/table.		
19. On the count of three, have the patient push up as much as possible while you pull him or her up by straightening your legs and hips and holding onto the belt.		
20. Pivot your entire body as well as the patient's.		
21. Lower the patient into the wheelchair by bending at your knees and hips as the patient sits down.		
22. Replace wheelchair parts and make sure they are secure.		
23. Help patient move back in wheelchair, straighten the seat cushion and the patient's clothing, and fasten seat belt.		
24. Adjust footplate for patient; cover with a lap robe.		
25. Position pillow(s) to provide proper body alignment and joint support.		
26. Wash your hands.		

The student has satisfactorily completed the procedure "STAND AND PIVOT TRANSFER (PASSIVE-ASSISTED)" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) _____ Date _____

Lesson 3: Transferring and Transporting Patients

Skill Sheet

SWING TRANSFER

Student Name _____ Date _____

EQUIPMENT:

1. Hospital bed
2. Wheelchair
3. Gait belt

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash your hands.		
2. Assemble necessary equipment.		
3. Identify and greet patient. Identify self.		
4. Explain to the patient that you are about to assist with the transfer.		
5. Provide privacy.		
6. Position the wheelchair to the patient's strongest/preferred side.		
7. Lock the wheels on the wheelchair.		
8. Remove both foot plates and the armrest nearest the patient; put them out of the way.		
9. Help the patient sit up and slide forward. (While the patient's feet may be on the floor, little or no weight will be borne on them.)		
10. Apply a gait belt.		
11. If possible, let the patient grasp the remaining armrest with one hand; the other hand should be ready to push down on the surface to help raise the body.		
12. Grasp the patient's knees between your knees.		
13. Hold the gait belt with both of your hands at the patient's sides.		
14. Ask the patient to bend forward and lower his or her head away from the seat of the wheelchair. Explain the count with command sequence; have the patient rock forward with each count.		

15. On the command, using good body mechanics, lift the patient enough to clear the surfaces, directing his or her buttocks toward the seat of the wheelchair.		
16. Help the patient move back in the wheelchair, straighten the seat cushion and patient's clothing, and fasten the seat belt.		
17. Replace wheelchair parts and make sure they are secure.		
18. Wash your hands.		

The student has satisfactorily completed the procedure "SWING TRANSFER" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 3: Transferring and Transporting Patients

Skill Sheet

SLIDING BOARD TRANSFER

Student Name _____ Date _____

EQUIPMENT:

1. Hospital bed or mat
2. Wheelchair
3. Gait belt
4. Sliding board

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash your hands.		
2. Assemble necessary equipment.		
3. Identify and greet patient. Identify self.		
4. Explain the procedure to the patient.		
5. Provide privacy.		
6. Position the wheelchair at an angle next to bed or mat.		
7. Lock the wheels on the wheelchair.		
8. Remove both foot plates and the armrest nearest the patient.		
9. Help the patient sit up and put on a gait belt.		
10. Have the patient lean away from the wheelchair by rolling up on his or her hips.		
11. Slide the board as far under the patient's hips as possible. Be careful not to pinch the patient's buttocks.		
12. Place the other end of the board on the wheelchair cushion, bridging just in front of the wheel of the wheelchair.		
13. Have the patient reach for the armrest with the leading hand and try to push his or her body up and toward the wheelchair with the trailing hand. NOTE: The patient with very weak arms may place his or her arms on your shoulders, but you must never allow the patient to grasp you around your neck.		

14. Steady the patient's knees between your knees.		
15. Grasp the gait belt with your hands and help the patient slide over to the wheelchair. The sliding process can be either slow or fast, much like the swing transfer. If necessary, this movement may be accomplished by several lift and slide motions.		
16. Remove the sliding board.		
17. Straighten the seat cushion and the patient's clothes, and fasten the wheelchair safety belt.		
18. Replace the armrest and foot plates and be sure they are secure.		
19. Wash your hands.		

The student has satisfactorily completed the procedure "SLIDING BOARD TRANSFER" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) — Date

Lesson 3: Transferring and Transporting Patients

Skill Sheet

SLIDING TRANSFER

Student Name _____ Date _____

EQUIPMENT:

1. Hospital bed or radiographic table
2. Stretcher
3. Sheet

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash your hands.		
2. Assemble necessary equipment.		
3. Identify and greet patient. Identify self.		
4. Explain the procedure to the patient.		
5. Provide privacy.		
6. Lock or block wheels of all equipment.		
7. Line up the stretcher parallel to the bed or radiographic table.		
8. Fold or place patient's arms close to the body.		
9. Remove pillows and be certain the patient's head or feet will not hit any obstacles during the transfer.		
10. Two caregivers stand next to the radiographic table and reach across it to grasp the sheet that is under the patient. They may place one of their knees on the table for better body mechanics.		
11. A third caregiver stands on the far side of the stretcher and grasps the sheet.		
12. On the count of three with a command, the caregivers smoothly slide (lifting slightly to minimize friction) the patient from the bed to the stretcher or from the stretcher to the radiographic table.		
13. If moving patient from bed to stretcher, replace pillows, cover the patient, straighten sheets, and put up stretcher's side rails.		
14. Wash your hands.		

The student has satisfactorily completed the procedure "SLIDING TRANSFER" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 3: Transferring and Transporting Patients

Skill Sheet

WHEELCHAIR TRANSFERS

Student Name _____ Date _____

EQUIPMENT:

1. Radiographic table
2. Wheelchair
3. Footstool

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Place the wheelchair parallel to and as close as possible to the radiographic table.		
2. Lock the wheels of the wheelchair.		
3. Explain to the patient that he or she needs to get out of the wheelchair and onto the radiographic table. Assure the patient that all the help he or she needs will be provided.		
4. Stand directly in front of the patient or on the patient's weaker side.		
5. Help the patient stand.		
6. Allow the patient time to get his or her bearings.		
7. If the footstool is used, ask the patient to step onto the stool with his or her best leg. As the patient steps up, he or she should bring the other foot up to the stool.		
8. Have the patient turn so that his or her back is to the radiographic table.		
9. Have the patient sit down on the side of the table with his or her legs over the edge.		
10. Ask the patient to lie down on his or her back.		
11. If the patient needs help, explain that you will be turning him or her to lie back on the table.		
12. Place one arm around the patient's back and shoulders and the other arm under the patient's knees.		
13. Use the arm around the patient's back and shoulders to lower the upper part of the body toward the table while using the arm under the patient's knees to lift and swing the patient's legs to the bottom of the table.		

The student has satisfactorily completed the procedure "WHEELCHAIR TRANSFERS" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

Lesson 3: Transferring and Transporting Patients

Skill Sheet

TRANSPORT VIA WHEELCHAIR

Student Name _____ Date _____

EQUIPMENT:

1. Wheelchair
2. Two sheets

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Prepare to transport a patient by taking along an extra sheet or two. For a wheelchair transport, use a sheet to cover the seat and back of the chair for the comfort of the patient. The second sheet is used to cover the patient's lap		
2. When pushing a patient in a wheelchair through the hospital, do not hurry.		
3. Try to always move the wheelchair in the direction the patient is facing.		
4. When getting on an elevator, enter it by moving forward. Once on the elevator, turn the chair around so the patient is facing the door.		

The student has satisfactorily completed the procedure "TRANSPORT VIA WHEELCHAIR" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 3: Transferring and Transporting Patients

Skill Sheet

TRANSPORT VIA STRETCHER

Student Name _____ Date _____

EQUIPMENT:

Stretcher

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Do not push the stretcher too fast, and always move the patient feet first. Elevate the patient's head if possible to allow the patient to see where he or she is going.		
2. There is generally not enough room to turn a stretcher around in an elevator. Enter the elevator with the patient's feet first. After exiting the elevator, turn the stretcher so that the patient's feet are pointing in the direction you are going.		

The student has satisfactorily completed the procedure "TRANSPORT VIA STRETCHER" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 4: Assisting with Elimination

Skill Sheet

GIVE AND REMOVE A BEDPAN

Student Name _____ Date _____

EQUIPMENT:

1. Gloves
2. Radiographic table or hard surface table
3. Bedpan
4. Small pillow or rolled towel
5. Toilet tissue
6. Washcloth

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash hands.		
2. Put on gloves.		
3. Explain what you are going to do.		
4. Provide privacy.		
5. Place patient in supine position or as close to supine position as possible.		
6. <u>Patient is unable to assist</u> a. Turn client on his or her side away from.		
b. Expose buttocks and position bedpan firmly against buttocks.		
c. Place a small pillow or rolled towel at the top of the bedpan at the small of the patient's back.		
d. Turn patient toward you and onto bedpan.		
<u>Patient is able to assist</u> a. Have the patient flex his or her knees and lift buttocks off table. Make sure the patient's gown is open in the back.		
b. With your other hand, slip the bedpan under the patient's hips and adjust.		
7. Place toilet tissue within reach.		
8. Remove gloves and dispose of in proper container.		

9. Wash hands, and leave the room. (Remain near enough to hear the patient if he or she calls out.)		
10. Return to the room promptly when the patient calls or check on him or her after five minutes. **NOTE:** Do not leave patient on bedpan over ten minutes--may lead to extreme discomfort and result in skin breakdown.		
11. Wash hands.		
12. Put on gloves.		
13. Patient is able to assist--Place one hand under the small of the back and assist patient to raise his or her hips. Hold bedpan with other hand. Patient is unable to assist--Hold bedpan with one hand and roll patient off pan with other hand. This will prevent contents of bedpan from spilling.		
14. Remove bedpan and then cover it.		
15. Wipe, wash, and dry perineal area from front to back.		
16. If urinary output if being measured, cover the bedpan and return it with the patient to his or her floor.		
17. If urinary output is not being measured, take bedpan to bathroom and empty into toilet.		
18. If bedpan is reusable, seal it in plastic and return to the appropriate department for sterilization.		
19. Remove gloves and dispose of in appropriate container.		
20. Wash hands.		
21. Give patient a clean, wet washcloth to wash his or her hands.		
22. Make patient comfortable.		

The student has satisfactorily completed the procedure "GIVE AND REMOVE A BEDPAN" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) _____ Date _____

Lesson 4: Assisting with Elimination

Skill Sheet

GIVE AND REMOVE A URINAL

Student Name _____ Date _____

EQUIPMENT:

1. Radiographic table or stretcher
2. Gloves
3. Urinal
4. Washcloth
5. Sheet

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Wash hands.		
2. Put on gloves.		
3. Explain what you are going to do.		
4. Provide privacy.		
5. Expose the perineal area.		
6. Place the client's penis in the urinal and lay the urinal between his legs.		
7. Make sure urinal is placed at an angle to keep urine from spilling out. Flat edge should be lying on stretcher.		
8. Cover the patient's lower body.		
9. Remove gloves and dispose of in appropriate container.		
10. Wash hands.		
11. Leave the room. (Remain near enough to hear the patient is he calls out.)		
12. Return to room promptly when the patient calls.		
13. Wash hands.		
14. Put on gloves.		
15. Remove and cover the urinal.		

16. If the patient's urinary output is being measured, return the urinal with the patient to his floor. If urinary output is not being measured, take the urinal to the bathroom and empty into toilet.		
17. Seal urinal in plastic and return to the appropriate department for sterilization.		
18. Remove gloves and dispose of in appropriate container.		
19. Wash hands.		
20. Give patient a clean, wet washcloth to wash his hands.		
21. Make patient comfortable.		

The student has satisfactorily completed the procedure "GIVE AND REMOVE A URINAL" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Written Unit Evaluation

Student Name _____ Date _____

Circle the letter that corresponds to the best answer.

1. What is the most effective way to protect yourself from radiation?

   a. Check equipment weekly.
   b. Maintain the greatest possible distance from the x-ray source.
   c. Keep a daily record of the amount of time you spend in the radiographic room.
   d. Always wear a lead apron.

2. What protective material is built into the walls of radiology departments?

   a. Reinforced concrete
   b. Asbestos
   c. Lead
   d. Insulation

3. Which of the following are not items of protective gear?

   a. Leaded gowns
   b. Neck collars
   c. Leaded aprons
   d. Leaded gloves

4. In the radiology department, when does a patient or staff member require special consideration?

   a. When he is working overtime
   b. When she is pregnant
   c. When she has been ill
   d. When he is a new employee

5. Which of the following types of tissue is highly sensitive to radiation?

   a. Nerve tissue
   b. Muscle tissue
   c. Mature bone tissue
   d. Lymphatic tissue

6. What is the most common type of dosimeter?

   a. Test strip
   b. Film badge
   c. Collar pin
   d. Pocket clip

7. What direction does an x-ray beam travel in an A.P. projection?

   a. From the back to the front of the patient
   b. From one side of the patient to the other
   c. From the front to the back of the patient
   d. From the head to the feet of the patient

8. Which of the following is <u>not</u> a basic position in which patients pose for radiographs?

   a. Supine
   b. Prone
   c. Posterior
   d. Oblique

9. Which of the following is <u>not</u> an aid used to help patients hold positions?

   a. Pillows
   b. Preformed cushions
   c. Angle sponges
   d. Sandbags

10. What is the most common type of radiograph performed in a general radiology department?

    a. Ankle
    b. Pediatric
    c. Upper GI
    d. Chest

11. Which form is given to patients who will receive IV contrast media?

    a. Permission to treat form
    b. General hospital admissions form
    c. Hill-Burton form
    d. Informed consent form

12. Which exam does <u>not</u> use a contrast medium?

    a. MRI
    b. Upper GI
    c. Lower GI
    d. IVP

13. What part of the body does a KUB radiograph show?

    a. Skull
    b. Abdomen
    c. Chest
    d. A cervical spine

14. Film cassettes are classified by:

    a. Color and coating.
    b. Height and depth.
    c. Brand and style.
    d. Type and size.

15. How is the barium mixture given for an upper GI?

    a. As an enema
    b. As an injection
    c. As a drink
    d. As a capsule

16. Grid cassettes are used for:

    a. All types of radiographs.
    b. When fine detail is required.
    c. Thicker body parts.
    d. Knee and shoulder joints.

17. How often should the x-ray table be cleaned?

    a. Daily
    b. Hourly
    c. After exams using contrast media
    d. After each patient

18. If you are cleaning blood or body fluids from surfaces in the x-ray room and one of the gloves you are wearing gets torn, you should:

    a. Finish the job, remove the gloves, and wash your hands.
    b. Remove the gloves and put on a fresh pair.
    c. Use only the hand with the undamaged glove to finish the job.
    d. Immediately remove the gloves, wash your hands, and reglove.

19. What should you use to clean areas where blood or body fluids are present?

    a. Germicide
    b. Antiseptic
    c. Bleach
    d. Alcohol

20. Where should you put toweling used to clean up blood?

    a. Directly into the washing machine
    b. In the laundry chute
    c. In a contaminated linen bag
    d. In a covered laundry basket

21. What should you wear when cleaning an excessive amount of blood or body fluids?

    a. Gloves and a leaded apron
    b. Leaded gloves and a lab jacket
    c. Gloves and a disposable apron
    d. Old clothes

22. Which of the following is <u>not</u> an item the radiology aide would normally be required to stock/restock?

    a. IV contrast media
    b. Surgical sutures
    c. Spray cleaners and disinfectants
    d. Disposable gloves and aprons

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

PREPARE THE PATIENT AND HIS OR HER RECORDS

Student Name _____ Date _____

EQUIPMENT:

1. Patient's file jacket
2. Requisition
3. Flash card
4. Patient gown

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Obtain the patient's file jacket. It can usually be found in either the records department, if the aide is working in a hospital setting, or in the radiology department's file section at a clinic.		
2. Review the jacket. Most film cases list contents by type of radiograph and date. If the patient has had an exam of this type previously, pull the previous films and the radiologist's report.		
3. Stack the old reports on top of the old radiographs and attach them to the front of the file jacket.		
4. Put the current requisition and a flash card on top of this packet.		
5. Place the packet in the ready bin for the radiographer		
6. <u>Patients who do not need assistance</u> a. Escort the patient to the changing area.		
b. Explain which articles of clothing must be removed, usually everything except the underpants (unless a barium enema is being done; then everything must be removed).		
c. Instruct the patient to put on a patient gown and remain in the changing area until you return to take him or her into a radiographic room for the examination.		
7. <u>Patients who need assistance</u> a. Assist the patient to the changing area.		
b. Help the patient remove all necessary articles of clothing, leaving only underpants (unless a barium enema is being done; then everything must be removed).		
c. Assist the patient to put on a gown, and then assist the patient to the radiographic room.		

The student has satisfactorily completed the procedure "PREPARE THE PATIENT AND HIS OR HER RECORDS" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

SET UP FOR AN ORTHOPEDIC EXAM

Student Name _____ Date _____

EQUIPMENT:

1. Cassettes
2. Radiographic table
3. Pillows
4. Flash card
5. Identification camera

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Make sure there are enough cassettes in the correct size on hand for the exam.		
2. Check the cassettes to make sure they are clean.		
3. Make sure the radiographic table is clean and the pillowcase is fresh.		
4. Assist the patient to the radiographic room.		
5. Help the patient onto the table, if necessary. If the patient does not need to be on the table for the exam, help him or her to a chair and explain that the radiographer will arrive momentarily to perform the exam.		
6. Place the patient's flash card in the ID camera. The room is prepared for the radiographic exam.		

The student has satisfactorily completed the procedure "SET UP FOR AN ORTHOPEDIC EXAM" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

SET UP FOR A CHEST EXAM

Student Name _____ Date _____

EQUIPMENT:

1. Cassettes [14 x 17 in. (35 x 43 cm) for adults and 11 x 14 in. (30 x 35 cm) or 10 x 12 in. (24 x 30 cm) for infants]
2. Chest stand, radiographic table, or immobilization device
3. Flash card
4. Identification camera
5. Radiographic table and chair

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Make sure there are two general radiography cassettes available: 14 x 17 in. (35 x 43 cm) for adults and 11 x 14 in. (30 x 35 cm) or 10 x 12 in. (24 x 30 cm) for infants.		
2. Be sure the outside of the cassettes is clean.		
3. Check to ensure the chest stand, radiographic table, or immobilization device for infants has been cleaned since the previous exam.		
4. Assist the patient to the radiographic room.		
5. Help the patient onto the table if necessary. If the patient does not need to be on the table for the exam, help him or her to a chair and explain that the radiographer will arrive momentarily to perform the exam.		
6. Place the patient's flash card in the ID camera. The room is prepared for the exam.		

The student has satisfactorily completed the procedure "SET UP FOR A CHEST EXAM" according to the steps outlined.

_____ _____

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) Date

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

SET UP FOR AN UPPER GI EXAM

Student Name _____ Date _____

EQUIPMENT:

1. Barium
2. Water
3. Barium cup
4. Drinking cup and/or straw
5. Packet of gas granules
6. General purpose cassettes [two 14 x 17 in. (35 x 43 cm), two 11 x 14 in. (30 x 35 cm), and two 10 x 12 in. (24 x 30 cm)]
7. Lead aprons
8. Flashcard
9. Identification camera
10. Patient ID
11. Radiographic table
12. Footboard
13. Gown
14. View box
15. Monitor

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Mix the barium preparation according to the radiologist's preference.		
2. Shake well for 20 to 30 seconds.		
3. Place a drinking cup and/or straw next to the barium cup.		
4. Put the packet of gas granules (if doing a double-contrast exam) next to the barium cup.		
5. Make sure there are six general purpose cassettes, including two 14 x 17 in. (35 x 43 cm), two 11 x 14 in. (30 x 35 cm), and two 10 x 12 in. (24 x 30 cm) on hand.		
6. Set out enough lead aprons for the personnel involved in the exam.		
7. Place the flash card in the ID camera and flash one 14 x 17 in. (35 x 43 cm) cassette with the patient ID.		
8. Place this film in the table bucky (a film holder underneath the table top).		

9. Place the footboard on the table.		
10. When the patient is gowned, assist him or her to the radiographic room and onto the radiographic table.		
11. Help the patient assume the supine position for the A.P. scout film.		
12. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see.		
13. Angle the radiographic table to the vertical position.		
14. Position the monitor for easy viewing by the radiologist. The room is now prepared for the upper GI exam.		

The student has satisfactorily completed the procedure "SET UP FOR AN UPPER GI EXAM" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

SET UP FOR A LOWER GI EXAM

Student Name _____ Date _____

EQUIPMENT:

1. Barium
2. Water
3. Enema bag
4. IV pole and components
5. Lead aprons
6. One pair of disposable gloves
7. One pair of leaded gloves
8. Tube or packet of lubricating gel
9. One pair of hemostats
10. Four to five spot films
11. Cassettes (four to six 14 x 17 in. general radiology cassettes, two 11 x 14 in. general radiology cassettes, and two 14 x 17 in. grid cassettes)
12. Flash card
13. Identification Camera
14. Patient ID
15. Footboard
16. Gown
17. Radiographic table
18. View box and monitor

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Mix the barium preparation.		
2. Shake well for 20 to 30 seconds.		
3. Fill the enema bag.		
4. Attach the components (air bulb to the larger tube, air insufflator to the smaller tube).		
5. Hang the bag on the IV pole.		

6. Set out lead aprons for the personnel involved in the exam. Also, the following equipment should be laid out and available for the radiographer: · one pair of disposable gloves, · one pair of leaded gloves, · tube or packet of lubricating gel, · one pair of hemostats, · four to five spot films, · four to six 14 x 17 in. general radiology cassettes, · two 11 x 14 in. general radiology cassettes, and · two 14 x 17 in. grid cassettes.		
7. Place the flash card in the ID camera and flash one 14 x 17 in. cassette with the patient ID.		
8. Place this film in the table bucky.		
9. Place the footboard on the table.		
10. When the patient is gowned, assist him or her to the radiographic room and onto the radiographic table.		
11. Help the patient assume the supine position for the A.P. scout film.		
12. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see.		
13. Position the monitor for easy viewing by the radiologist. The room is now prepared for the lower GI exam.		

The student has satisfactorily completed the procedure "SET UP FOR A LOWER GI EXAM" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature (Verifying Satisfactory Completion) _____ Date _____

Lesson 2: Assisting in the Radiographic Room

Skill Sheet

SET UP FOR AN INTRAVENOUS PYELOGRAM (IVP)

Student Name _____ Date _____

EQUIPMENT:

1. Flash card
2. Identification camera
3. Patient ID
4. Gown
5. Bottle(s) of contrast media
6. One or two large syringes (50-60 ml)
7. One or two large-gauge needles
8. One small-gauge needle for the injection
9. Alcohol prep pads (1-2)
10. Tourniquet
11. Band-Aid™
12. One pair of disposable gloves
13. One emesis basin
14. Cassettes (four to five 14 x 17 in. regular cassettes, two to four 11 x 14 in. regular cassettes, two 10 x 12 in. regular cassettes)
15. Radiographic table
16. View box

CHECK IF THE STUDENT DID THE FOLLOWING	YES	NO
1. Lay the following items out in a neat and easily accessible order: · bottle(s) of contrast media, · one or two large syringes (50-60 ml), · one or two large-gauge needles, · one small-gauge needle for the injection, · alcohol prep pads (1-2), · tourniquet, · Band-Aid™, · one pair of disposable gloves, · one emesis basin, · four to five 14 x 17 in. regular cassettes, two to four 11 x 14 in. regular cassettes, and · two 10 x 12 in. regular cassettes		
2. Place the patient's flash card in the ID camera, and flash one 14 x 17 in. cassette with the patient ID.		

3. Assist patient into the radiographic room and onto the radiographic table.		
4. Help the patient to assume the supine position for the A.P. scout film.		
5. After the radiographer exposes the film, process the film and place it on the view box for the radiographer and radiologist to see. The room is now prepared for the IVP.		

The student has satisfactorily completed the procedure "SET UP FOR AN INTRAVENOUS PYELOGRAM (IVP)" according to the steps outlined.

Instructor's/Approved Clinical Supervisor's Signature
(Verifying Satisfactory Completion)

Date

Written Unit Evaluation

Student Name_____ Date _____

Circle the letter that corresponds to the best answer.

1. When answering the telephone in the radiology department, the radiology aide should identify the department and _____.

    1. The hospital.
    2. The radiologist.
    3. State his or her name.
    4. Repeat the department's phone number.

2. Which of the following is <u>not</u> considered an effective telephone technique in the radiology department?

    1. Demand details to demonstrate knowledge and authority.
    2. Put the caller on hold while you go get the secretary.
    3. Speak slowly and clearly.
    4. Keep a pen/pencil and paper handy.

3. When recording a message involving a telephone number or address, it is a good idea to:

    1. Depend on your memory.
    2. Repeat the number or address back to the caller.
    3. Get the information from the patient's file after the call.
    4. Hang up as soon as the caller tells you the number or address so it is fresh in your mind.

4. What does NPO mean?

    1. No patient orders
    2. Nothing by mouth
    3. Not prepared for operation
    4. No physical examination ordered

5. What is a prep?

    1. A conservatively dressed hospital employee
    2. A special x-ray film
    3. Part of the x-ray tube
    4. A set of instructions designed to prepare a patient for an examination

6. If a patient wants a detailed description of an examination, it is often necessary for the radiology aide to:

   a. Refer the patient to a supervisor.
   b. Share what information he or she knows.
   c. Tell the patient it is better to wait and see.
   d. Tell the patient to ask somebody who has had that exam.

7. How long must a facility retain radiographic films of adult patients?

   a. 5-6 months after the last exam
   b. 23 years
   c. 5-7 years after the last exam
   d. Until the facility runs out of room

8. How long must a facility retain a minor patient's radiographic films?

   a. 10 years
   b. For a period of two years after he or she legally becomes an adult
   c. 2 years
   d. Until he or she is 16 years old

9. In order to efficiently schedule patients for radiographic exams, the radiology aide must have a thorough knowledge of the _____ required for each exam.

   a. Radiographic techniques
   b. Radiographic positions
   c. Preparations
   d. Medical insurance

10. Why is filing radiographic films alphabetically impractical in a very large facility?

    a. It is too complicated.
    b. Confusion might result from patients having the same name.
    c. No facilities use alphabetical filing.
    d. It is illegal.

11. Why might someone from another facility request radiographs from your hospital/clinic?

    a. To learn what kind of film your facility uses
    b. To see if your facility has better radiographers
    c. To reclaim the silver from your films
    d. To compare them with new exams

12. What are the two most common methods of filing radiographic films?

    a. Social security numbers and birth dates
    b. Patient admission numbers and telephone numbers
    c. Alphabetically and by examination
    d. Alphanumeric and color/bar code

13. What long-term storage method might a facility use to reduce the size of stored radiographs?

    a. Digitize the radiographs and store them on computer disks
    b. Separate the small films from the large ones
    c. Use an off-site storage vault
    d. Compress patient files

Radiology Aide Competency Record

Name and Address: _____

Directions: Evaluate the student by entering the appropriate number to indicate the degree of competency.

Rating Scale (0-6):

0 **No Exposure** - no experience/knowledge in this area; program/course did not provide instruction in this area

1 **Unsuccessful Attempt** - unable to meet knowledge or performance criteria and/or required significant assistance

2 **Partial Demonstration** - met some of the knowledge or performance criteria with or without minor assistance

3 **Knowledge Demonstrated** - met knowledge criteria without assistance at least once

4 **Performance Demonstrated** - met performance criteria without assistance at least once

5 **Repetitive Demonstration** - met performance and/or knowledge criteria without assistance on multiple occasions

6 **Mastered** - successfully applied knowledge or skills in this area to solve related problems independently

(IBM) 1-98

NOTE: The code in brackets is the competency identification number used in computerized management systems.

☐ The student has successfully completed the Health Care Assistant Core Competencies.

0-6	Date	A. Orientation to Radiology
		1. Identify roles of radiology team members [A001]
		2. Apply legal and ethical standards to radiographic procedures [A002]
		3. Respond appropriately to clinical situations [A003]
		4. Complete incident report [A004]
		5. Greet and direct radiology patients [A005]
		6. Identify approaches for communicating with patients [A006]
		Other: _____
		_____

0-6	Date	B. Darkroom Duties
		1. Identify parts and functions of the processor [B001]
		2. Prepare processor for operation [B002]
		3. Maintain darkroom integrity [B003]
		4. Restock film [B004]
		5. Flash radiograph with patient identification [B005]
		6. Process radiographs [B006]
		7. Unload and clean cassettes [B007]
		8. Match processed radiographs with correct jacket and requisition [B008]
		Other: _____
		_____

0-6	Date	C. Basic Patient Care
		1. Select appropriate personal protective equipment [C001]
		2. Identify special precautions to follow when caring for geriatric patients [C002]
		3. Identify signs of infiltrated IVs [C003]
		4. Supervise an independent transfer [C004]
		5. Transfer patient from bed to wheelchair [C005]
		6. Transfer patient from stretcher to radiographic table [C006]
		7. Transfer patient from wheelchair to radiographic table [C007]
		8. Transport patient via wheelchair [C008]
		9. Transport patient via stretcher [C009]
		10. Transport patient on oxygen therapy [C010]
		11. Assist patient to and from bathroom [C011]
		12. Give and remove a bedpan [C012]
		13. Give and remove a urinal [C013]
		14. Maintain patient's urinary catheter [C014]
		15. Identify the radiology aide's role in assisting professional staff with critically injured or ill patients [C015]
		16. Respond to signs and symptoms of patient distress [C016]
		17. Follow hospital emergency code procedures [C017]
		18. Initiate adult CPR [C018]
		Other: _____
		_____

0-6	Date	D. Radiographic Room Responsibilities
		1. Follow radiation safety practices [D001]
		2. Identify types of radiographic procedures [D002]
		3. Identify radiographic cassettes by size and type [D003]
		4. Prepare the patient and his or her records for the exam [D004]
		5. Set up room for orthopedic exam [D005]
		6. Set up room for chest exam [D006]
		7. Mix barium preparation [D007]
		8. Set up room for upper GI [D008]
		9. Set up room for lower GI [D009]
		10. Set up room for IVP [D010]
		11. Assist radiographer to position patients for radiographs [D011]
		12. Clean radiographic room, observing body substance precautions [D012]
		13. Restock supplies and linens [D013]
		Other: _____
		_____

0-6	Date	E. Office Procedures
		1. Answer phone and record messages [E001]
		2. Confirm appointments [E002]
		3. Schedule procedures [E003]
		4. File radiographs accurately [E004]
		Other: _____
		_____

Certificate of Achievement

This is to certify that

_____

Achieved the Competencies
as Acknowledged for
Radiology Aide
And is Therefore Recognized

This _____ Day of _____, _____

_____ _____

Instructor Administrator